

VOLUME 7

NOV 14 1975

T:T:F:EMO

Dear [REDACTED]

This refers to your letter of September 19, 1975, in which you submitted, for classification under the Gun Control Act of 1968, a United States Patent Application covering a modification to a semiautomatic firearm which would permit bursts of automatic fire which can be varied from one round per second to the maximum cyclic rate of the particular weapon.

After study of your Patent Application we are in agreement with your statement in the abstract of disclosure that the modification permits semiautomatic and automatic operation. Further, we agree with your statement contained in claim 4 of the application, that while continuous finger pressure is maintained on the trigger the weapon will fire continuously. Based on your statements and an examination of the submitted Patent Application, a firearm modified according to your design would be classified as a machinegun as that term is defined in Section 5845(b), Chapter 53, Title 26, United States Code. In order to manufacture or modify a firearm utilizing your design feature, the appropriate special occupational taxes and manufacturing fee would be required prior to manufacturing the weapons for resale. If you intend to manufacture or modify a firearm for your own use, a \$200.00 making tax must be paid prior to the manufacture or modification of a weapon.

We trust that the foregoing has been responsive to your inquiry. If we can be of further assistance, please contact us.

Sincerely yours,

(Signed) Thurman W. Darr

cc: Legal

Mr. Keathley
Rep. ~~Gault~~
Gude

Enclosure

for A. Atley Peterson
Assistant Director.

CODE	INITIATOR	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER
SUR-NAME	Queen	Tramm	Darr	Keathley	Willard	Harg	Darr
DATE	10/28/75	10/30/75	10/31	11-4-75	11-14-75	11/14/75	11/14/75

cc: Regional Director
Mid-Atlantic

EMOwen:lse 10/28/75

Secretary of the Treasury
Washington D.C.

19 September 1975

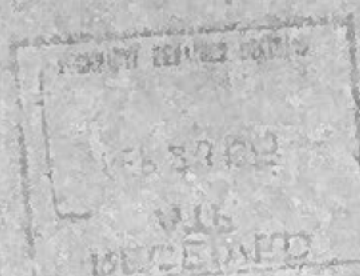
Dear Sir,

I have invented a new type of firearm described in this patent. The Army has shown some serious interest in the concept, and it would be very unwise to have extra copies of this document shipped in the US Mail there for please have your agency make a determination of the disposition of this concept (semi-automatic or machinegun) and return the document to me.

Make copies of only those passages and drawings needed for your records.

I will on request come to the offices in Washington D.C. and pick-up the material with a letter of disposition. The subject is very important so please have your officers be most concise and site referances if needed.

Sincerely Yours.





Statement of
Robert J. Scroggie, Firearms Enforcement Officer
Bureau of Alcohol, Tobacco and Firearms
made at
Washington, D.C., on March 26, 1975

On February 20, 1975, [REDACTED] who gave his address as [REDACTED] appeared in my office with a Valmet M62/S, 7.62X39mm caliber weapon, identified by the Serial Number 147341.

At that time, [REDACTED] requested that his firearm be examined and classified under the provisions of the Gun Control Act of 1968, stating that he had redesigned the lock system of this semiautomatic civilian model of the Finnish Model 62 Assault Rifle. He further stated that his redesign would permit the firearm to achieve what he termed "quick-fire." A term meaning, as he explained, that the trigger would be forced forward by the rearward movement of the bolt during the extraction and ejection phases of the firing cycle.

A preliminary physical examination of the firearm disclosed that major modifications had been made to the lock mechanism and lock well. The modifications are depicted in the accompanying drawing, which were submitted by [REDACTED]

After my cursory examination was completed, I took the weapon to the Northern Virginia Police Academy Firing Range on March 10, 1975. There I loaded the weapon with a magazine containing three cartridges. I charged the weapon by retracting the bolt handle and releasing it. The bolt ran forward stripping the top round out of the magazine and chambering it. I then pulled the trigger and the cartridge in the chamber and the two cartridges remaining in the magazine were fired in a single burst. I reloaded the weapon with a magazine containing three more cartridges, charged the weapon and again fired a burst of three rounds.

On March 20, 1975, a meeting was held between Messrs. Dessler and Wachter of the Office of the Chief Counsel and Messrs. Westenberger, Scroggie and Owen of the Firearms Technology Branch, concerning the status of this firearm. Mr. Dessler concluded that, if [REDACTED]

- 2 -

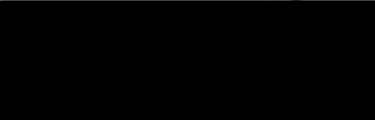
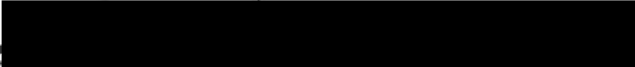
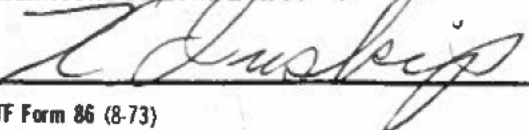
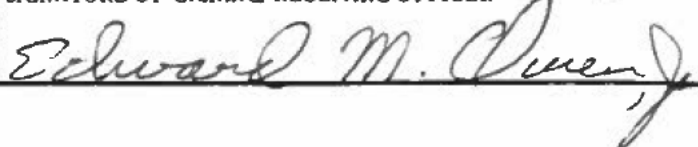
was not a person prohibited from possessing a firearm by Title VII, it might be permissible for him to make application to make and pay the \$200.00 making tax and thereby register the firearm in question. The final determination would only be made subsequent to the results of Special Agent Gerlands investigation.

During the early afternoon of March 20, 1975, I received a telephone call from [REDACTED]. He asked me if I had had a chance to test his weapon. I told him I had, and that it was found that his weapon was a machinegun. He answered that it was not intended to be a machinegun and further, he was going to contact Representative Gilbert Cude of Maryland and have the statutory definition of machinegun changed. I told him that that was his prerogative, however, I would write him a letter confirming our findings. Later in the afternoon, I received another call from [REDACTED]. He stated that it was not necessary for me to write a letter to him as he did not wish to embarrass the Bureau. I told him that it would not embarrass this Bureau and that I would be happy to write the classification letter.


On Monday, March 24, 1975, I was called to court in Baltimore, Maryland. I returned to Washington on March 26, 1975, I found that Special Agent Gerland had picked up the weapon and removed it from the Bureau Headquarters before I had had an opportunity to complete my examination.



Robert J. Scroggie
Firearms Enforcement Officer

DEPARTMENT OF THE TREASURY BUREAU OF ALCOHOL, TOBACCO & FIREARMS								DATE PREPARED 2/20/75			
TRANSFER/RECEIPT OF PERSONAL PROPERTY								NO.			
ITEM NO.	LOC CODE	B/N CODE	BASIC NOMENCLATURE DESCRIPTION	SERIAL NUMBER	TYPE CODE	SIZE CODE	REP'L CODE	COMP YEAR	QUANT	UNIT COST	
										Dollars	Cts
			Valmet M2 semiautomatic rifle caliber 7.62X39mm	147341					1		
			temporarily transferred to ATF Firearms Technology Branch for the purpose of test and evaluation								
			received from: 								
ORIGINAL DOCUMENT NO.			GOVERNMENT BILL OF LADING NO.		SHIPPED VIA				DATE SHIPPED		
<input type="checkbox"/> TRANSFER-(TRANSACTION CODES 50, 55)					<input checked="" type="checkbox"/> LOAN						
OFFICE CODE		OFFICE DESCRIPTION			OFFICE CODE		OFFICE DESCRIPTION				
FROM 					TO: T.T.F. Firearms Technology Branch						
SIGNATURE OF LOSING/SHIPPING OFFICER 				DATE 2/20/75		SIGNATURE OF GAINING/RECEIVING OFFICER 				DATE 2/20/75	

DEPARTMENT OF THE TREASURY BUREAU OF ALCOHOL, TOBACCO & FIREARMS								DATE PREPARED			
TRANSFER/RECEIPT OF PERSONAL PROPERTY								NO.			
ITEM NO.	LOC CODE	B/N CODE	BASIC NOMENCLATURE DESCRIPTION	SERIAL NUMBER	TYPE CODE	SIZE CODE	REP'L CODE	COMP YEAR	QUANT	UNIT COST	
										Dollars	Cts
			Valmet M62 semiautomatic rifle #147341 for seizure	#147341					1		
ORIGINAL DOCUMENT NO.			GOVERNMENT BILL OF LADING NO.		SHIPPED VIA				DATE SHIPPED		
<input checked="" type="checkbox"/> TRANSFER - (TRANSACTION CODES 50, 55)					<input type="checkbox"/> LOAN						
OFFICE CODE		OFFICE DESCRIPTION			OFFICE CODE		OFFICE DESCRIPTION				
FROM: TTF		Firearms Technology Branch Bureau Headquarters			TO:		Bureau of ATF (Washington D.C. Falls Church, Va. Field Office)				
SIGNATURE OF LOSING/SHIPPING OFFICER				DATE	SIGNATURE OF GAINING/RECEIVING OFFICER				DATE		
Edward M. Owen				3/24/75	[Signature]				3/24/75		




Dept of the Treasury
Bureau of Alcohol, Tobacco and Firearms
Washington, D.C.
20226

Dear Sir.

I have a rifle system which fires once for each time the trigger is pulled. However, many persons do not fully understand that this is a single function of the trigger for each bullet fires. Please, give me a letter pertaining to the rapid-fire system as applied to the m62 Valmet rifle.

Thank You

Sincerely Yours



1/3

Contrast of machiensun to rapid-fire system

TRIGGER:

Macheinsun-the trigger is returned by a spring when the trigger is released.

Rapid fire-the trigger is returned each time the bolt comes to the rear. The trigger is forced forward by the action of the jamming surface on the bolt carrier strikeing the surface of a plate: this movement is carried downwards to the trigger forcing it forward into an engaged position.

Damper:

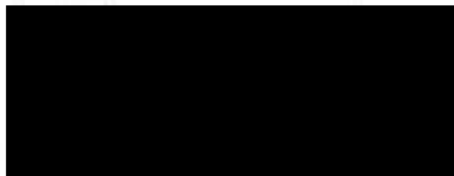
Macheinsun- the hammer damper is used every time the system fires more than one round in a burst to retard the fall of the hammer until the bolt is closed. (3)

Rapid fire- the trigger damper is used only to prevent the trigger from being pulled untill the bolt is safely closed. After the bolt is closed the trigger may be pulled again.

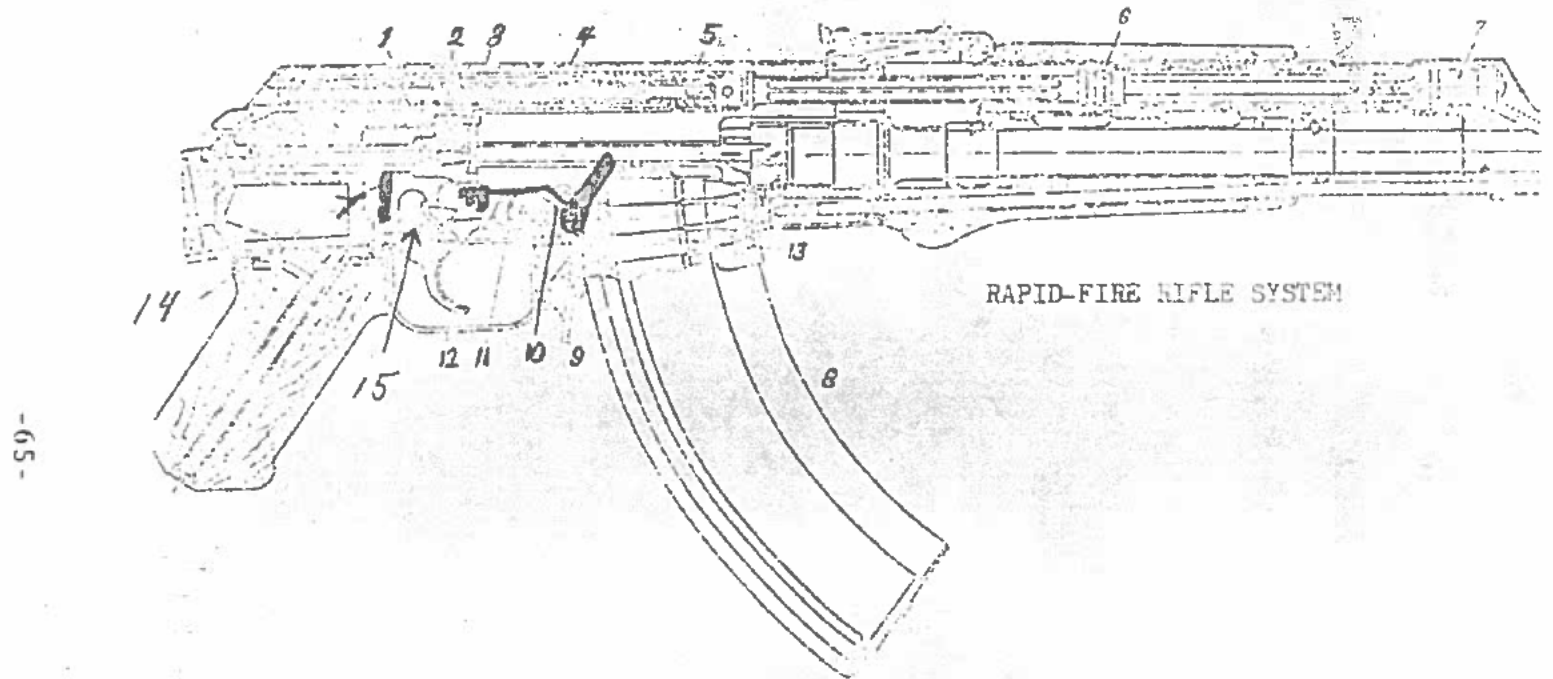
Note 1. No removal of parts can cause the system to operate automatically.

Note 2. No addition of automatic trigger sear can cause the system to operate automatically.

Note 3. No addition of automatic disconnector (hammer damper) can cause the system to operate in an automatically. The addition of a the standard AK-47 hammer damper would bend the pin and jam the system so that it would have to be disassembled by cutting. This is to discourage the missuse of the system!



2/3



-65-

Figure 62. Position of parts with operating rod in extreme rear position, and the striker plate forcing the trigger forward so that the disconnector disengages. 1 - hammer; 2 - bolt, 3 - firing pin; 4 - operating rod; 5 - return spring; 6 - gas piston; 7 - gas cylinder; 8 - magazine; 9 - magazine catch; 10 - trigger damper; 11 - trigger and hammer spring; 12 - trigger; 13 - rounds. 14-striker plate; 15-disconnector.

Dear Sir,

The reason I backed out of the court case ~~at~~ are:

- 1 The treasury had me set up so if I lost the appeal I would be held for trial by the court.
- 2 This operation relieved the ATF of liability for the arrest.
- 3 The judge does not have to accept the common use of English in court.
- 4 The treasury could judge shop.



United States Patent [19]

[11] 4,023,465

Inskip

[45] May 17, 1977

[54] FIREARM

[76] Inventor: Thomas C. Inskip, 6504 Democracy Blvd., Bethesda, Md. 20034

[22] Filed: June 27, 1975

[21] Appl. No.: 555,585

[52] U.S. Cl. 89/131; 89/142

[51] Int. Cl.² F41D 11/02

[58] Field of Search 89/131, 129, 136, 142

[56] References Cited

UNITED STATES PATENTS

2,873,650	2/1959	Pinkerton	89/131
3,029,708	4/1962	Marchisio	89/131
3,236,154	2/1966	Iwashita	89/131 X
3,251,268	5/1966	Mencking	89/131
3,292,492	12/1966	Sturtevant	89/142 X
3,301,133	1/1967	Sturtevant	89/131
3,715,954	2/1973	Rude	89/131 X

Primary Examiner—David H. Brown

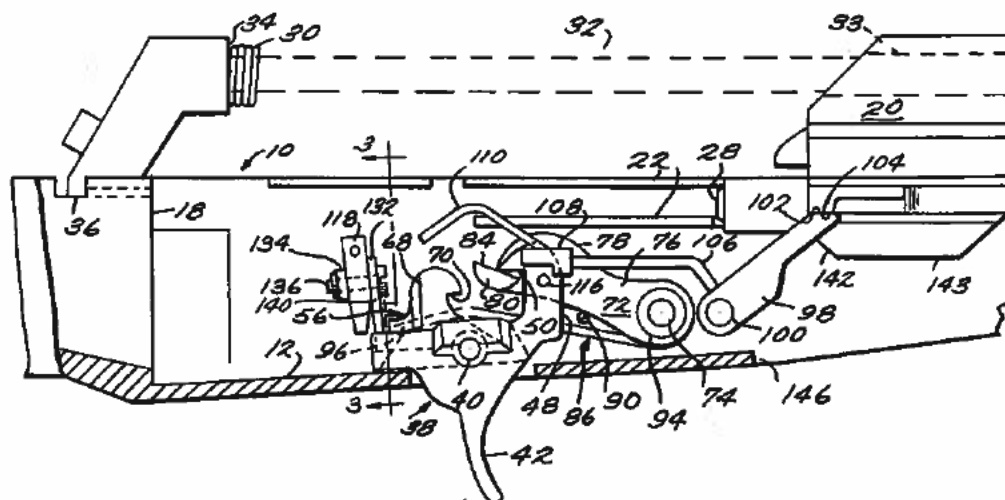
Attorney, Agent, or Firm—Cushman, Darby & Cushman

[57] ABSTRACT

An auto-loading firearm has a firing mechanism that

selectively permits (1) conventional semi-automatic operation or (2) automatic operation that permits bursts to be fired at a rate which can be varied between 1 and about 12 rounds per second in response to the finger pressure on the trigger, without release of the trigger or adjustment to the firearm. The mechanism for accomplishing variable rate of fire includes a cam surface on the bolt carrier which causes the trigger to move forward at one point in the firing cycle, an automatic trigger disengager device pivotally mounted on the frame for cooperation with the trigger, and a trigger depressor device, the mechanism being brought into an operating mode by a manually operated selector lever which has a variable fire position and a safety position. In the event that the variable rate mechanism becomes inoperative, as by breakage of a part the firearm will be fail safe and will operate in the semi-automatic mode. Certain existing firearms can be modified rather easily to include the variable fire rate mechanism, or the mechanism can be incorporated during initial manufacture of the firearm.

9 Claims, 8 Drawing Figures

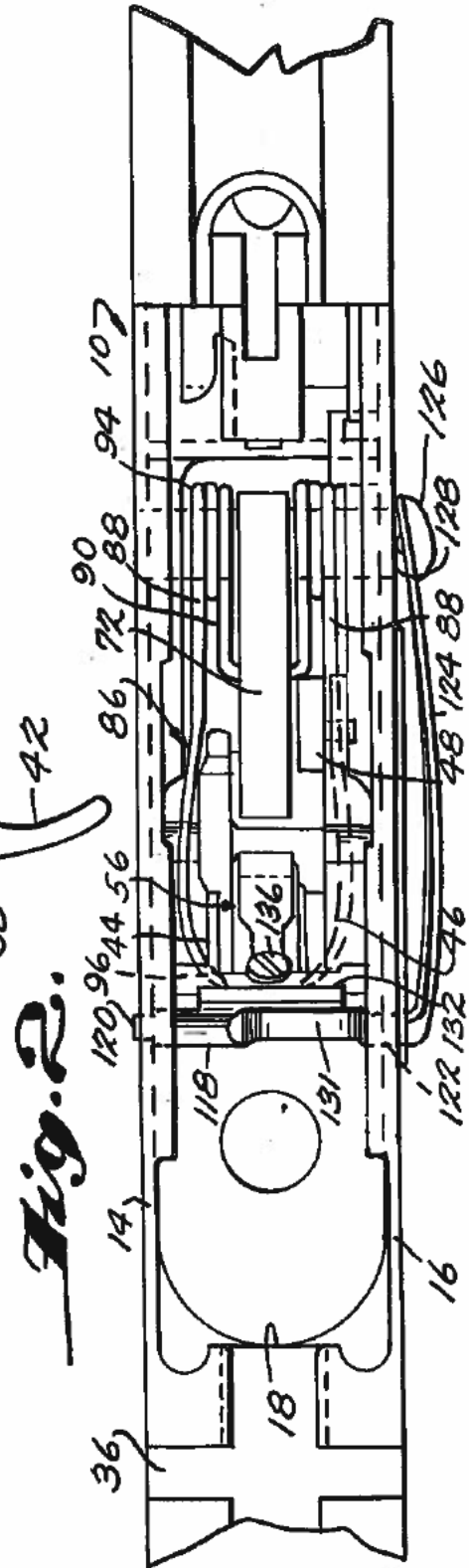
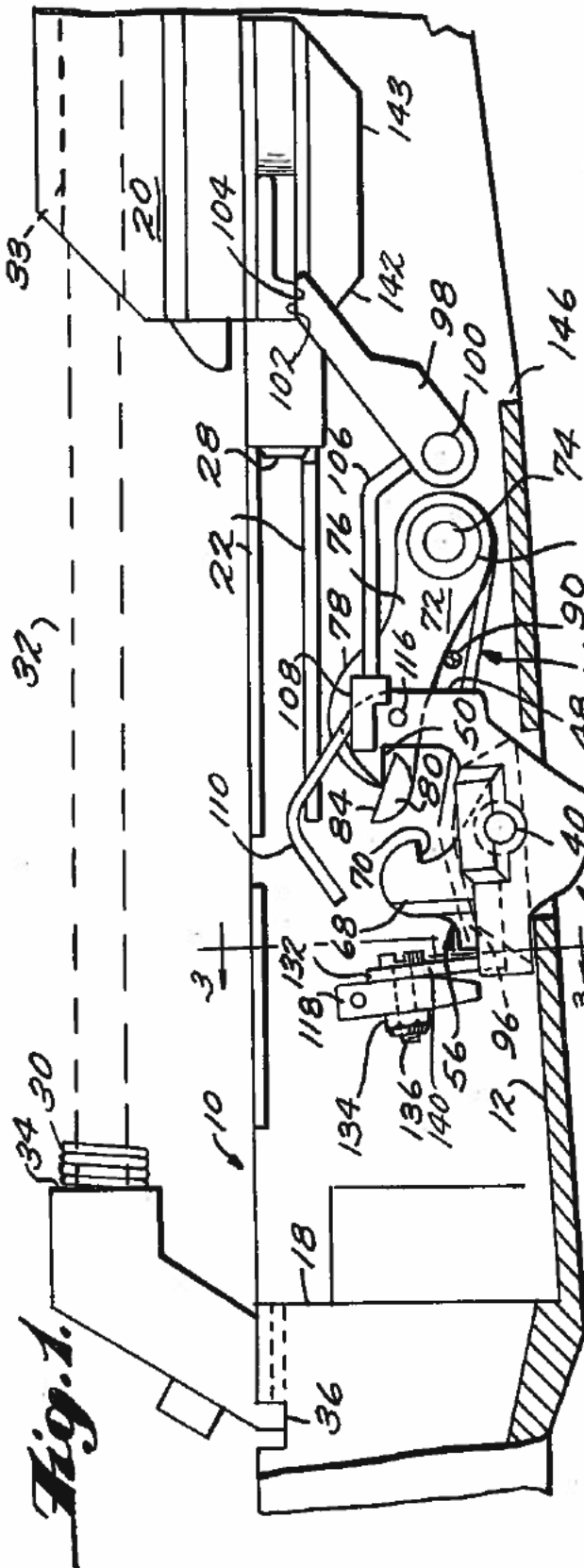


U.S. Patent

May 17, 1977

Sheet 1 of 4

4,023,465



U.S. Patent May 17, 1977

Sheet 2 of 4

4,023,465

Fig. 3.

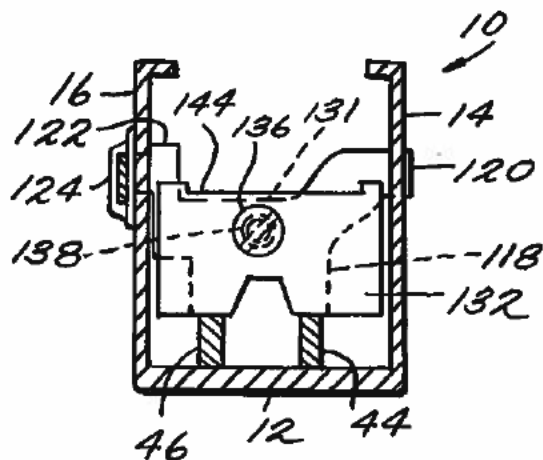


Fig. 4.

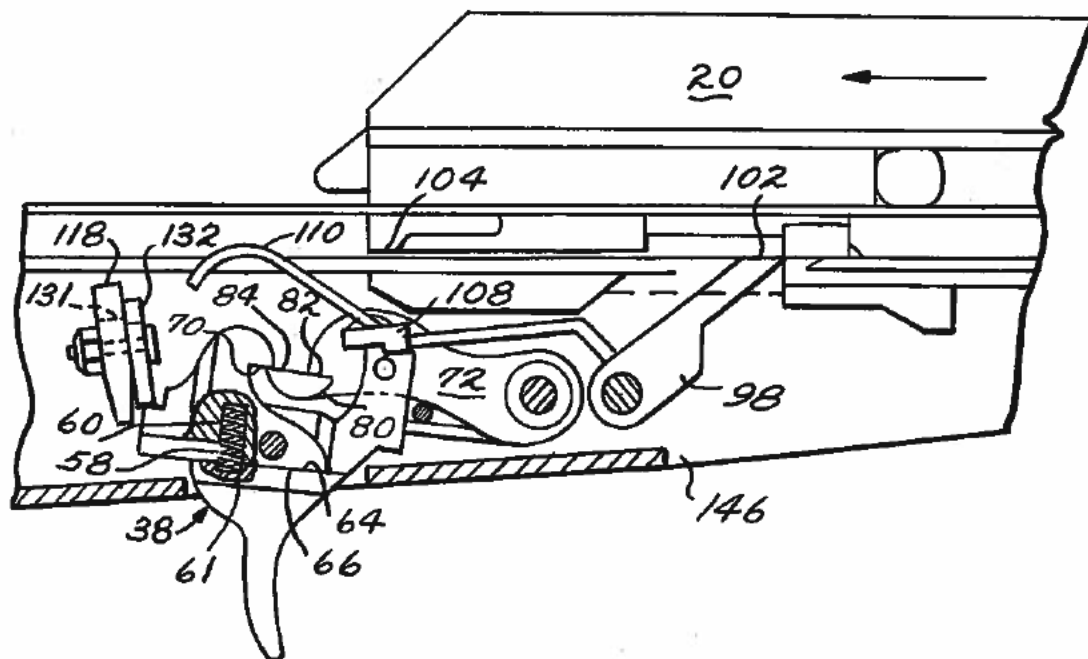


Fig. 5.

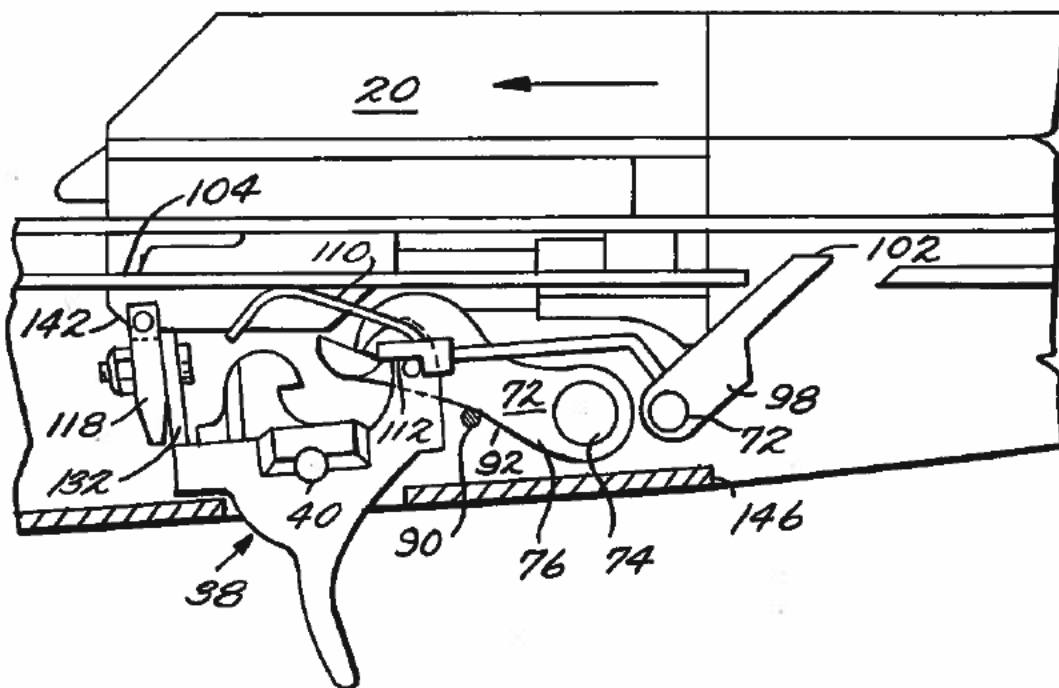
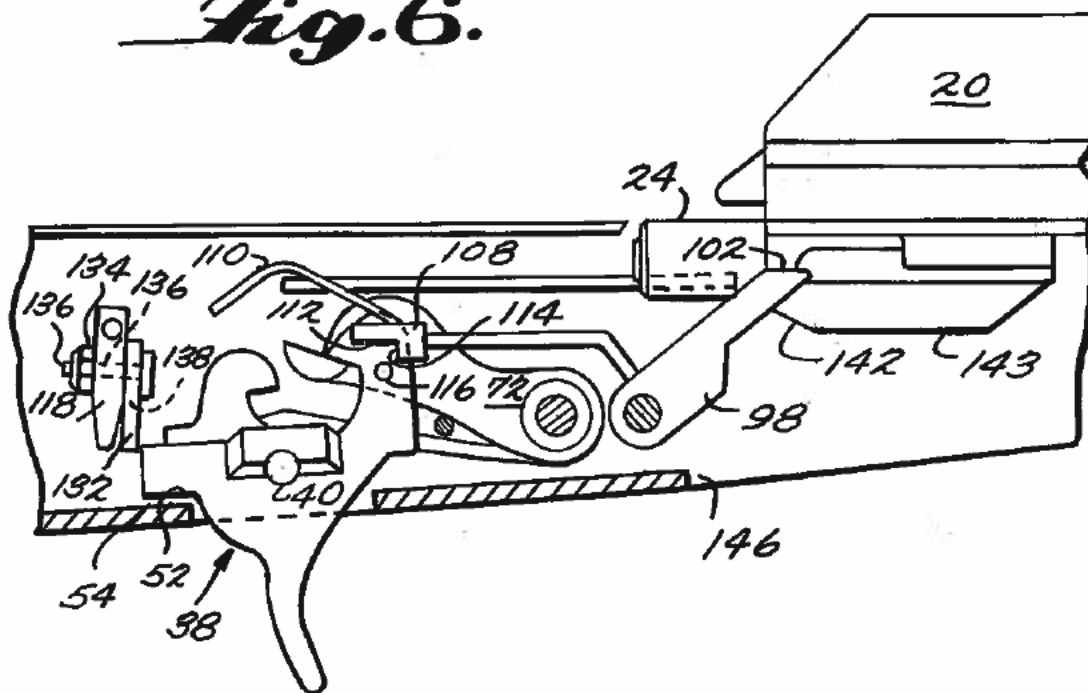


Fig. 6.



U.S. Patent May 17, 1977

Sheet 4 of 4

4,023,465

Fig. 7.

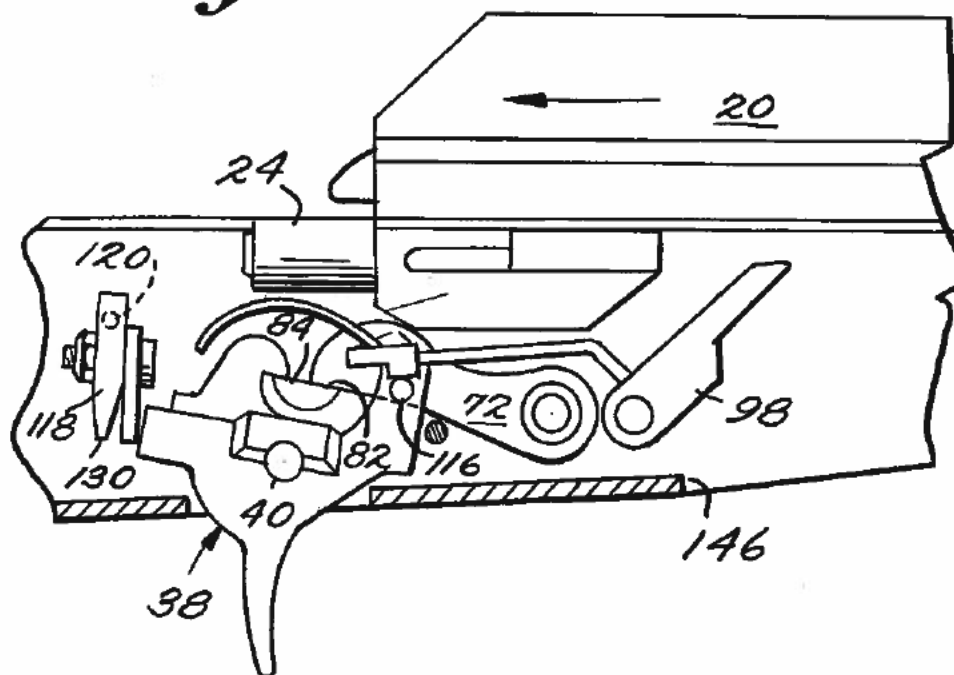
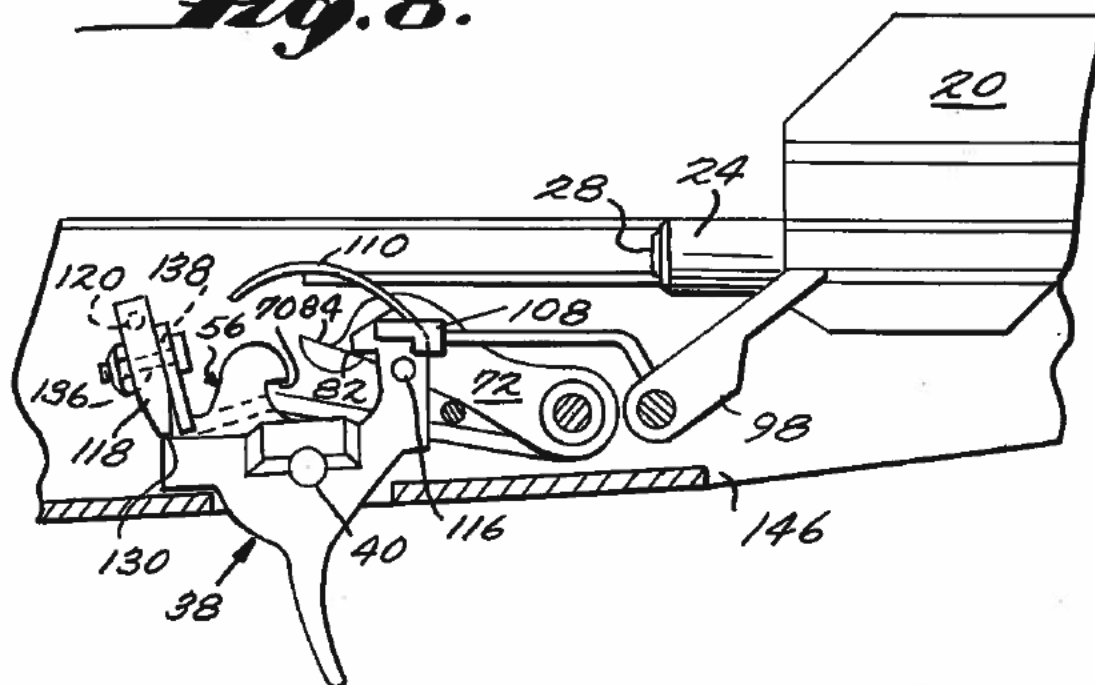


Fig. 8.



4,023,465

1

FIREARM

The present invention relates to a firearm having an improved firing mechanism which allows the operator to control the rate of fire by varying his finger pressure on the trigger during firing.

BACKGROUND OF THE INVENTION

The improved firing mechanism may be incorporated in any of a wide variety of firearms. For purposes of this patent application the invention is described and illustrated in combination with a rifle having a receiver or frame, a gas-operated longitudinally slidable bolt carrier mounted in the frame, a bolt disposed in the carrier, a spring biased hammer engageable with a firing pin in the bolt, and a trigger assembly mounted in the receiver. The forward end of the bolt carrier terminates in a piston residing in a fixed gas cylinder which receives pressurized gas through a port from the barrel of the rifle. When the trigger is forced to the rear by the operator's finger the hammer is released so as to pivot forward and strike the rear end of the firing pin which is thus forced forward into engagement with the primer of a cartridge disposed in a chamber at the rear end of the barrel. Burning of the powder in the cartridge forces the bullet down the barrel past the gas cylinder port, and hot gases pass through the port into the cylinder so as to force the piston, bolt carrier and bolt to begin moving rearwardly. During the initial movement the bolt rotates slightly relative to the frame and carrier so as to become disengaged from locking lugs on the receiver. During continued rearward movement, the carrier strikes and passes over the hammer forcing it to pivot backwards until it is engaged and held in a cocked position by the trigger assembly. The front end of the bolt in succession pulls the empty shell from the chamber and ejects it from the rifle. The carrier then strikes the rear of the receiver and stops. A longitudinally disposed spiral spring having its rear end fixed with respect to the receiver and its front end engaged with the carrier is compressed by the rearward movement of the carrier. As soon as the carrier is stopped by striking the receiver the spring begins to force the carrier forward. As the carrier moves forward the bolt picks up a fresh cartridge from a magazine or clip and moves the fresh cartridge into the chamber. The bolt engages cam surfaces on the carrier causing the bolt to rotate in the carrier and become locked in the receiver against rearward movement. The carrier moves slightly forward thereby rendering the trigger mechanism functional, in the sense that the mechanism is now permitted to operate in its intended manner.

All of the above is broadly conventional in automatic and semi-automatic firearms and need not be described or illustrated in detail in the present patent application. Accordingly, the drawings are limited to the details of the special firing mechanism which is the subject of this invention, with the conventional features being either omitted or illustrated schematically. More in particular, the described and illustrated rifle is a modified rifle of a known basic design, specifically a Soviet military weapon, known as an AK-47, which is selectively operable in either a semi-automatic or a full automatic (constant rate of fire) mode. The unmodified rifle is fully described in a publication entitled "The AK-47 Assault Rifle" edited by Wyant La Mont (Normount Technical Publications, Wickenburg, Ariz., Copyright

2

1969 by Donald B. Mclean). A further existing firearm which is readily modified to incorporate the present invention is the M62/s, a Finnish military rifle.

Firing mechanisms for changing the rate of fire in automatic firearms, by creating a delay in the operation of the mechanism, are disclosed in U.S. Pat. Nos. 3,015,993, 3,029,708 and 3,236,154.

SUMMARY OF THE INVENTION

The present invention provides a firing mechanism which effects variable rates of fire in response to the operator's finger pressure on the trigger. This is accomplished primarily by means of a special delay characteristic achieved by positively and rapidly kicking the trigger in a forward direction against the operator's finger pressure after each round is fired and by locking the trigger in this forward position until another round has been locked in the chamber. The kicking action of the trigger against the operator's finger increases the time required for the finger pressure to move the trigger again to its firing position. This delay is greater when finger pressure is reduced, and as a result the operator can control the rate of fire with his trigger finger. The kicking action is achieved in the preferred embodiment by means of a trigger depressor element which upon pulling of the trigger moves into the path of the bolt carrier so as to be struck by the latter during its rearward movement and be forced against the trigger.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a vertical sectional view of the receiver portion of a rifle embodying the principles of the present invention, showing the firing mechanism cocked and ready for firing in a variable rate mode;

FIG. 2 is a plan view of FIG. 1;

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 1;

FIGS. 4 and 5 are views similar to FIG. 1 showing the parts in different positions during firing in a variable rate mode;

FIGS. 6 and 7 are sectional views illustrating the parts in a semi-automatic mode of fire; and

FIG. 8 is a sectional view illustrating the parts when the rifle is on safety.

DETAILED DESCRIPTION

Referring to FIGS. 1 and 2 there is shown in vertical section the receiver portion of a rifle embodying the firing mechanism of the present invention. All the parts of the rifle which are not illustrated may be conventional.

The rifle includes a channel-shaped receiver 10 having a bottom wall 12, left and right side walls 14 and 16, and a rear wall 18. Longitudinally slidable in the upper portion of the receiver 10 is a bolt carrier 20 or slide which is supported by means of conventional ribs 22 or flanges projecting from the inner surfaces of the side walls 14 and 16. A bolt 24 is carried in a recess in the lower end of the carrier 20 for limited longitudinal and rotative movement relative to the carrier 20, as is conventional. A longitudinally moveable firing pin 28 is disposed within the bolt 24. A gas-operated piston (not shown) is connected to the right hand end (not shown) of the bolt carrier 20 to move the latter rearwardly immediately upon firing of a cartridge. A spiral return spring 30 returns the carrier 20 to its forward locked position after firing. The spring 30 is mounted on a fixed rod 32 which is received into a bore 33 in the

4,023,465

3

carrier 20 during rearward movement of the latter, the spring 30 being compressed between the carrier 20 and a stop 34 on the rod 32 during such movement. The rear end of the rod 32 is releasably latched into a notch 36 in the receiver 10 so that the rod 32 and spring 30 may be manually removed during disassembly of the rifle.

The trigger assembly includes a trigger 38 pivotally mounted to the receiver 10 by means of a pin 40 and having the usual projection 42 for engagement by the trigger finger of an operator. The portion of the trigger above the finger projection 42 is generally channel-shaped in that it has two upwardly projecting parallel bars or ribs 44 and 46 extending longitudinally in the receiver 10. The forward end of the right hand rib 46 terminates in a hook-shaped primary sear 48 having a downwardly and rearwardly facing sear surface 50. The rear ends of the ribs 44 and 46 have downwardly facing stop surfaces 52 which are engageable with the adjacent surface 54 of the bottom wall 12 of the receiver 10 to limit forward movement of the trigger 38.

Between the ribs 44 and 46 of the trigger 38 is a secondary trigger member or sear 56 which is pivotally mounted by the same pin 40 as the primary trigger 38 so as to be movable independently of the latter. The secondary sear 56 is biased forwardly relative to the trigger 38 by means of a spiral compression spring 58 which is retained in a cylindrical recess 60 in the sear 56 and in a generally coaxial recess 61 in the trigger 38. Pivotal forward movement of the sear 56 is limited by engagement of a downwardly facing stop surface 64 on the sear 56 with an upwardly facing portion 66 of the trigger 38. An upwardly projecting hook-shaped portion 68 extends from the body of the secondary sear 56 and provides a downwardly facing sear surface 70.

A hammer 72 is pivotally mounted at its lower end to the receiver 10 by means of a pin 74, for movement between a forward, or fired position and a rearward or cocked position. The hammer 72 includes a body 76 which in the cocked position resides in the space between the ribs 44 and 46 of the trigger 38. In the fired position the forward or striking surface 78 of the hammer 72 engages the rear end of the firing pin 28. A laterally projecting head 80 is provided on the upper end of the hammer body 76. The under surface of the head 80 serves as a forward sear surface 82 for engagement with the sear surface 50 on the primary sear 48 and as a rearward sear surface 84 for engagement with the sear surface 70 on the secondary sear 56.

A hammer and trigger spring 86 serves to swing the hammer 72 forward to its firing position and also to bias the trigger 38 toward a forward cocked position. The spring 86 is a single length of wound 3-strand cable forming two spaced apart generally straight parallel portions 88 which are continuous with a central spring loop 90. The loop 90 presses against the rear surface 92 of the hammer body 76 and during cocking or firing movement of the hammer 72 the loop 90 pivots either rearwardly or forwardly about the hammer pivot pin 74 by virtue of two sets of spring loops 94 which surround the hammer pivot pin 74. The end portions 96 of the cable spring 86 engages the lower rear end portions of the ribs 44 and 46 on the trigger 38 in a manner to bias the latter in a counterclockwise direction as viewed in the drawings.

The firing mechanism also includes a trigger disengagement arm 98 located at the right hand side of the receiver 10 and pivoted at its lower end to the receiver

4

10 by a pin 100. The arm 98 extends upwardly and forwardly and has a cam surface 102 on its upper end disposed in the path of a cam surface 104 on the bolt carrier 20 so that the arm 98 will be acted on by the cam surface 104 during operation of the rifle. A stiff rod 106 is rigidly connected at its forward end to the arm 98 and rigidly carries at its rearward end a trigger disengagement sear 108. A spring 110 is rigidly attached at one end to the sear 108 and extends upwardly into the path of the bolt carrier 20. The sear 108 has a downwardly facing L-shaped sear surface 112, 114 which, when the arm 98 is pivoted counterclockwise, is engageable with a trigger sear pin 116 projecting laterally from the right hand rib of the trigger 38. When thus engaged with the pin 116 the sear 108 locks the trigger 38. The sear 108 is moved down by engagement of the bolt carrier 20 with the spring 110 when the bolt carrier 20 moves to a rearward position during operation in the variable rate mode.

A further assembly forming part of the firing mechanism includes a selector lug 118 pivotally mounted in the receiver 10 behind the trigger 38 by means of two pin portions 120 and 122 which are mounted in the receiver side walls 14 and 16. The right hand pin 122 is rigidly connected to the rear end of a manually operated selector arm 124 which is disposed outside the right hand receiver wall 16. The forward end of the selector arm 124 is provided with a laterally projecting tab 126 which can be gripped by the fingers of an operator to swing the arm 124 up or down. The inner surface of the arm 124 carries a small projection 128 which snaps into any one of three recesses (not shown) in the outer surface of the receiver side wall 16 in order to latch the arm 124 in an up, intermediate or down position. The firing mechanism is on safety when the arm 124 is in an up position. The intermediate and down positions place the firing mechanism in a variable rate mode and a semi-automatic mode, respectively.

In the safety position, as seen in FIG. 8, the lower surface 130 of the selector lug 118 overlies the rear portion of the trigger 38 so that the latter cannot be pulled. Movement of the selector arm 124 to either the intermediate or down position swings the lug 118 rearwardly away from the trigger 38. The upper edge of the lug 118 is provided with a notch 131 through which the bolt and bolt carrier pass when moving to and from their full rearward positions.

A trigger depressor plate 132 is loosely carried on the front surface of the selector lug 118 by means of a nut 134 and a bolt 136 which passes through holes in the plate 132 and in the lug 118. The hole 138 in the plate is slightly larger than the shank of the bolt 136 so that slight vertical movement of the plate 132 relative to the lug 118 can take place. Rotation of the plate 132 about the bolt 136 is prevented by sliding engagement of the side edges 140 of the plate 132 with the side walls 14 and 16 of the receiver 10.

The trigger depressor plate 132 is disposed so that it is non-functional when the selector arm 124 is in either its safety position (FIG. 8) or its semi-automatic position (FIGS. 6 and 7). When the arm 124 is in the intermediate (variable rate) position (FIGS. 1, 4 and 5) the plate 132 is in a position in which it cooperates with the bolt carrier 20 and with the trigger 38. The most important aspect of this cooperation is that in this mode of operation a cam surface 142 on the bolt carrier 20 can strike and pass over the upper edge 144 of the plate 132, causing the plate 132 to move downwardly and

4,023,465

5

thereby kick the trigger 38 slightly forward. Considering this action more in detail it will be seen in FIG. 4 that pulling of the trigger 38 forces the plate 132 upward, as permitted by the loose fit between the plate 132 and the bolt 136. The upper edge 144 of the plate 132 now lies in the path of the cam surface 142 on the bolt carrier 20 so that as the carrier 20 moves rearwardly it cams the plate 132 downwardly against the upper surfaces of the trigger ribs 44 and 46. This forces the trigger 38 to rotate counterclockwise about the trigger pin 40. The rotational force imparted to the trigger 38 is of course stronger than any finger pressure exerted on the trigger 38 in the opposite direction. While the downward force on the plate 132 is generated by the cam surface 142 on the bolt carrier 20 in the illustrated embodiment the same force could equally well be generated by a cam surface on the bolt 24.

OPERATION IN THE VARIABLE RATE OF FIRE MODE

FIG. 1 illustrates the parts in the variable rate mode with the bolt 24 closed and locked and the hammer 72 cocked, the sear surface 50 on the trigger 38 being in contact with the forward sear surface 82 on the hammer 72. The trigger disconnector sear 108 has been raised away from the trigger sear pin 116 by clockwise rotation of the disconnector arm 98 under the action of the cam surface 104 on the bolt carrier 20. When the trigger 38 is pulled the primary trigger sear surface 50 pivots forward about the trigger pin 40 and releases the hammer 72 which then swings forward under the action of the spring 86 and strikes the firing pin 28.

The clockwise pivoting of the trigger 38 causes upward motion of the trigger depressor plate 132 relative to the selector lug 118. When the lower edge of the hole 138 in the plate 132 engages the shank of the bolt 136 the trigger 38 stops.

In FIG. 4, the bolt carrier 20 and bolt 24 have moved rearwardly under the action of the gas-operated piston (not shown) as described earlier. The cam surface 142 on the moving carrier 20 has engaged the hammer 72 and has forced the latter counterclockwise about its pin 74 to a position in which the cam surface 70 on the secondary sear 56 is in engagement with the rear cam surface 84 on the hammer 72.

As the bolt carrier 20 continues to move toward the rear from the position illustrated in FIG. 4 the cam surface 142 on the carrier 20 depresses and passes over the trigger disengagement spring 110 so that the trigger disengagement arm 98, its rod 106 and its sear 108 are rotated counterclockwise about the pin 100. The sear 108 is now in a position, as seen in FIG. 5, just above the trigger disengagement pin 116. Upon further rearward movement of the carrier 20 as shown in FIG. 5 the cam surface 142 forces the trigger depressor plate 132 down against the upper surfaces of the trigger ribs 44 and 46, thereby causing the trigger 38 and the secondary member 56 to pivot counterclockwise (forwardly) even though the operator's finger may still be exerting pressure on the projection 42. This moves the trigger disengagement pin 116 up and to the rear so that it engages in the junction between the surfaces 112 and 114 in the disengagement sear 108. The trigger 38 is now held in its counterclockwise position and cannot be pulled clockwise. The counterclockwise movement of the secondary trigger element 56 allows the hammer

6

72 to swing clockwise until sear surfaces 50 and 82 engage.

The bolt carrier 20 continues to move toward the rear until it strikes the rear wall 18 of the receiver 10 whereupon the return spring 30 begins to move the carrier 20 forward. During the last part of the rearward movement of the carrier 20 the spent cartridge is ejected in the conventional manner. The sear 108 remains in the down position until the carrier 20 has moved all the way forward (FIG. 1). The cam surface 104 on the carrier has now engaged the cam surface 102 on the disengagement arm 98 so as to pivot the arm 98, its rod 106 and its sear 108 clockwise to a position in which the sear 108 is out of contact with the sear pin 116. In moving forward the carrier 20 will have picked up a fresh cartridge from a magazine (not shown) fitted into a magazine opening 146 in the bottom wall 12 of the receiver 10. At this point the operator's finger pressure on the trigger projection 42 may cause the rifle to fire again.

The above-described sequence of operation provides a variable rate of fire which is responsive to the magnitude of the operator's finger pressure on the trigger projection 42. With a light finger pressure a trained operator can fire a single shot, and when the trigger projection 42 is pulled back hard the firearm will fire continuously (fully automatic) at essentially the maximum rate of the particular firearm, this being about 700 rounds per minute for an AK-47 rifle. Variable finger pressures will produce firing rates between a single shot and maximum rate. The fundamental explanation of this is that the operator's finger will, in effect or in actuality, become temporarily disengaged from the trigger when the finger pressure is less than that which will maintain maximum automatic fire rate. That is, the very rapid counterclockwise movement of the trigger 38 when the trigger depressor plate 132 is kicked down by the bolt carrier 20 is sufficient to reduce or remove finger pressure from the trigger. This delays the return of finger pressure sufficient to actuate the trigger again, even though the operator will not have relaxed his trigger finger.

Chart I illustrates the sequence of major operations which occur during one cycle of firing in a variable rate mode. For comparison purposes Chart II illustrates a cycle of conventional full automatic firing, for example, the operation of an unmodified AK-47 rifle set to operate in a fully automatic mode.

OPERATION OF THE SEMI-AUTOMATIC MODE

To operate the illustrated rifle in a semi-automatic mode the selector level 124 is moved manually to its down position. This swings the selector lug and the trigger depressor plate 132 to a position, illustrated in FIG. 6, in which the plate 132 cannot be engaged by the trigger 38. The other parts in FIG. 6 are in the same position as in FIG. 1, that is the carrier 20 and the bolt 24 are completely forward and the hammer 72 is being held in a cocked position by engagement of the sear surfaces 80 and 82. Pulling of the trigger 38 releases the hammer and fires a round but does not effect any movement of the trigger depressor plate.

Rearward movement of the carrier 20 and the bolt after a round has been fired forces the hammer 72 counterclockwise by engagement of the cam surface 142 with the front surface 78 of the hammer 72, as previously described and as illustrated in FIG. 7. The sear surface 84 on the hammer 72 now engages under

7

4,023,465

8

the sear surface 70 on the secondary trigger member 56 so that the hammer 72 is held back by the latter even if the operator's finger is not released from the trigger. The hammer 72 is not held back in this manner in the variable rate mode, because the trigger 38 is kicked 5 counterclockwise soon after the hammer 72 has been rotated counterclockwise. That is, in the variable rate mode, engagement of sear surfaces 84 and 70 is momentary and the holding back of the hammer 72 is immediately transferred to sear surfaces 82 and 50. 10 Again referring to FIG. 7, when the trigger is released by the operator it will be rotated counterclockwise by the hammer and trigger spring 86 thereby releasing sear surfaces 84 and 70. The hammer 72 then moves clockwise until its sear surface 82 engages the trigger 15 sear surface 50. The carrier 20 has by now returned to its forward position and the rifle can be fired again by pulling back on the trigger. The reciprocating movement of the carrier 20 will have actuated the arm 98, rod 106 and sear 108 thereby temporarily locking the trigger so that the hammer 72 cannot follow the carrier 20 forward.

The variable rate firing mechanism is fail safe in the sense that failure of its parts permits operation of the rifle in the semi-automatic mode even without adjusting the position of the selector lever 124. If the trigger depressor plate 132 breaks the secondary trigger element 56 will come into operation, as described above, because the trigger 38 will not be kicked forward. In the event of the failure of the arm 98, rod 106, sear 108 or spring 110 the trigger 38 will go rearward before the bolt 24 closes past the hammer cocking point, causing the secondary trigger 56 to again come into operation. If the pin 116 becomes broken, the trigger would go rearward before the bolt 24 closes past the hammer cocking point, causing the secondary trigger element to again become operative.

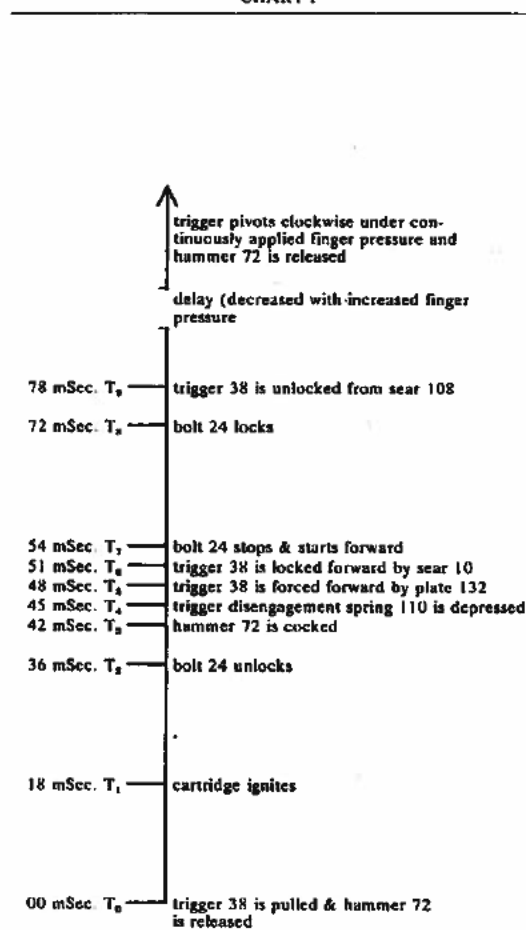
It will be noted also that if the secondary trigger member 56 breaks while the selector lever 124 is in its variable fire position, the firing mechanism will continue to fire in a variable mode. That is, the hammer sear 82 will move into engagement with the trigger sear 50.

A further reliability feature of the illustrated rifle results from the multifilament wound spring 86 which is standard in the AK-47 rifle and which is resistant to breakage in cold weather. Failure of this type of spring is generally only partial in the sense that one filament will break before the next filament breaks. The remaining filament or filaments have sufficient strength to operate the trigger and hammer, and the broken filament will be detected by routine examination.

The standard AK-47 also includes a further reliability feature in that the standard primary trigger has two 55 primary sears 48, one associated with each trigger rib 44 and 46. The standard hammer head 80 spans both sears 48 so that the hammer sear surface 82 engages both trigger sear surfaces 50. Therefore, if one side of the hammer is broken off, or if one of the trigger sears 60 48 fails, the remaining trigger sear 48 and its sear surface 50 will continue to cooperate with the hammer.

When it is desired to place the firing mechanism on safety the selector lever 124 is manually moved to its full up position. This swings the selector lug 118 to a 65 position directly over the ribs 44 and 46 of the trigger 38, as illustrated in FIG. 8, so that the trigger cannot be rotated clockwise.

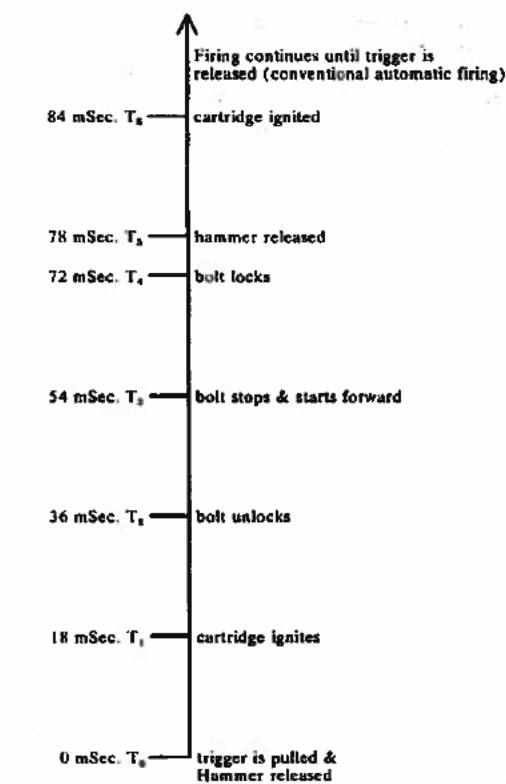
CHART 1



4,023,465

9

CHART II



What is claimed is:

1. In a firearm firing mechanism, a trigger movable in first and second directions, a hammer which is moved to a cocked position automatically upon the firing of a round and which cooperates with said trigger so as to be released when said trigger is moved in said first direction, and means operable after said trigger has been moved in said first direction and in response to the firing of a round for rapidly and positively moving said trigger in said second direction against finger pressure being exerted on said trigger by the operator so that finger pressure on said trigger is momentarily opposed whereupon the time period before said trigger is again moved in said first direction by the operator's finger is inversely proportional to the magnitude of the operator's finger pressure on the trigger.

2. A firing mechanism as in claim 1 wherein said means for rapidly and positively moving said trigger in said second direction includes a reciprocating member operable to move through a single cycle upon firing of a cartridge and a trigger depressor member driven in response to movement of said reciprocating member for engaging and moving said trigger.

3. A firing mechanism as in claim 1 wherein said trigger is pivoted for swinging movement in said first and second directions and wherein said means for rapidly and positively moving said trigger in said second direction includes a reciprocating member operable to move through a single cycle upon firing of a cartridge, a trigger depressor member movable into the path of said reciprocating member upon swinging of said trigger in said first direction and subsequently movable

10

upon movement of said reciprocating member to swing said trigger in said second direction.

4. In a firearm, a bolt assembly which operates automatically upon firing of a cartridge to accept a fresh cartridge; a trigger; a hammer which upon firing of a cartridge is automatically moved to a cocked position, said trigger and hammer cooperating in a manner such that while continuous finger pressure greater than a preselected value is exerted on said trigger said hammer becomes released from its cocked position after a fresh cartridge has been accepted by said bolt assembly so that said firearm will fire continuously while said finger pressure is maintained; reciprocating means forming part of said bolt assembly automatically movable in a first direction in response to firing of a cartridge and subsequently in a second direction; and means cooperating with said reciprocating means and with said trigger for delaying the release of said hammer by said trigger inversely proportional to the magnitude of finger pressure on said trigger whereby the operator of the firearm may increase and decrease the rate of fire by, respectively, increasing and decreasing his finger pressure on the trigger.

5. A firearm as in claim 4 wherein said means cooperating with said trigger includes a trigger depressor element mounted to be moved by pulling of said trigger rearwardly by the operator into the path of said reciprocating means as the latter moves in said first direction so that said trigger depressor element is struck by said reciprocating means and is forced in an opposite direction against said trigger to thereby move said trigger to a forward position, said firearm further comprising means for locking said trigger in said forward position and for unlocking said trigger during movement of said reciprocating means in said second direction.

6. A firearm as in claim 5 including a manually adjustable selector arm cooperating with said trigger depressor element to move said trigger depressor element out of the path of movement of said trigger upon movement of said selector arm to a preselected position whereby said trigger depressor element and said delaying means become non-functional.

7. A firearm as in claim 6 including a secondary element cooperating with said trigger and having a sear surface engageable with a sear surface on said hammer when said trigger depressor element is non-functional for holding said hammer back until finger pressure is released from said trigger.

8. In a firearm firing mechanism: a trigger assembly having a movable finger element for engagement by an operator's finger; a bolt assembly which moves automatically in a first direction upon firing of a cartridge and then in a second direction to accept a fresh cartridge and move the same into a firing position; a hammer assembly having a hammer element which is moved to a cocked position in response to movement of said bolt assembly in said first direction, said hammer assembly and said trigger assembly cooperating during the movements of said bolt assembly in a manner such that while continuous finger pressure greater than a preselected value is exerted by an operator on said finger element said hammer element becomes released from its cocked position after a fresh cartridge has been accepted by said bolt assembly so that the firing mechanism will operate continuously while said finger pressure is maintained on said finger element; and firing rate control means cooperating with said bolt assembly and with said trigger assembly for varying the

4,023,465

11

rate of operation of said firing mechanism by delaying operation of said mechanism, after each cartridge has been fired, in an amount inversely proportional to the magnitude of finger pressure on said finger element whereby the rate of fire may be increased or decreased by the operator by increasing or decreasing, respectively, his finger pressure on said finger element.

9. A firing mechanism as in claim 8 wherein said rate control means includes trigger depressor means and

12

trigger disengagement means operative in response to movement of said bolt assembly to move said finger element in a direction against the operator's finger pressure to a displaced position, then to hold said finger element in said displaced position against the operator's finger pressure and then to release said finger element so that it may be moved by the operator's finger pressure.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65

MAY 27 1988

LE:F:TE:CSL

[REDACTED]

[REDACTED]

This refers to your undated letter to our Cincinnati, Ohio office which has been forwarded to this office for a response.

You have requested information regarding a device that you have improvised for your own gun. You have requested to be advised of its classification in regards to the Gun Control Act of 1968 (GCA) or the National Firearms Act, (NFA) and requirements for the manufacturing and sale of such a device.

Based on the information that you have provided, your device, an electrically powered trigger actuator would fall within the purview of the NFA.

Section 5845(b), chapter 53, Title 26, United States Code, (U.S.C.), defines a "machinegun" as any weapon which shoots, is designed to shoot, or can be readily restored to shoot, automatically more than one shot, without manual reloading, by a single function of the trigger. A weapon on which a device such as you describe has been affixed would fire more than one shot, without manual reloading, by a single function of the electrical switch(trigger) and therefore meets the definition of a machinegun as defined.

Further, section 5845(b), Title 26, U.S.C. also states the term "machinegun" shall also included the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended for use in converting a weapon into a machinegun. Therefore, a device such as you describe would meet that definition even if it were not attached to any firearm.

CODE	INITIATOR	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER
	LE:F:TE	LE:F:TE					
SUR-NAME	Larkin	Collins					
DATE	5-26-88	5-27-88					

-2-

[REDACTED]

In order to manufacture these devices you would need to be licensed as a manufacturer (Type 07) as required by the GCA. Further, you would have to be licensed as a special taxpayer (occupational) under the NFA as a class 2 manufacturer. Additionally, since May 12, 1986 machineguns as defined in section 5845(b), Title 26, U.S.C. can only be manufactured for sale to government agencies or for export.

We regret that our classification of your device is not more favorable. We trust, however, the foregoing information will be useful in your endeavor.

Sincerely,

Edward M. Owen, Jr.
Chief, Firearms Technology Branch

CSL:kk:05-26-88 Disk L-11
cc: SAC RRA Firearms Div.

ATF 0522



DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
6519 Federal Office Building
550 Main Street
Cincinnati, Ohio 45202-3263
May 5, 1988

CSK
88

MW:CT:FL:LBR

MEMORANDUM TO: Firearms Technology Branch
Bureau Headquarters

FROM: Firearms & Explosives Coordinator
Midwest Region - Cincinnati, Ohio Office

SUBJECT: Classification of a firing mechanism

Please see attached information which is being forwarded
to you for a determination.

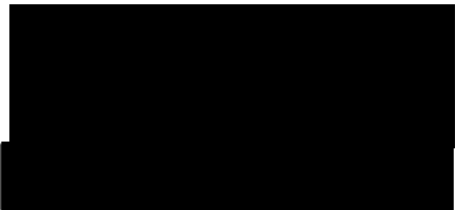
Thank you.


Leo B. Reed

Attachments

MAY 5 - 1988

NW:CT:FL:LBR



Your letter requesting classification of a firing mechanism has been forwarded to our Firearms Technology Branch in Washington, DC for a reply to you.

Sincerely yours,

Leo B. Reed
Firearms & Explosives Coordinator

11

I am requesting legal information on a device I have made for my gun.

This device is mounted to a semi-auto .22 .

The device consists of a 12v motor, two gears and one of them containing a lobe which rubs against the trigger.'

The gun can fire very fast but the gun ~~its~~ self has not been altered in any way, size, shape, or form.

The lobe that rubs the trigger pushes the trigger to fire the gun and also fully releases the trigger back to its original position so the gun can fire again.

The gun fires once and only once every time the trigger is tripped. By having an electric motor run the lobe, the process is repeated at a rapid rate, thus simulating the effect of a full-automatic.

I read the ATF's definition of a machine gun and as far as I could tell this was not a machine gun. Because the trigger has to be released before the gun can fire the next shot.

(2)

This device mounts onto the trigger guard and is adjusted so that the shallow part of the lobe is just lightly touching the trigger. Then when the high part of the lobe comes around it pushes the trigger back thus fires the gun and when the shallow part comes around it allows the trigger to re-set its self.

A momentary push-button switch runs the motor. As long as the switch is held down the motor will run.

I was using my car battery to power the motor. Now I am using three 6 volt batterys.

I wish to condense this whole device and batterys into something that is very lightweight and portable. Maybe add a voltage regulator or something that would give me a variable speed. So when I mounted guns with a longer stroke that it would not fire to fast.

If I reach this goal, would this product be legal (to mount on most any smi-automatic) with out th ATF considering it a machine gun?

If this device is legal in Indiana would it be le

3

in the other states?

I would like any information concerning the law on this device for use, manufacturing, and sale thereof.

I feel that I have described this device and my intentions accurately and fully as possible.

Thank you for your time...

AFT compliance

127 part CFR 178.11

NOV 30 1992

LE:F:TE:CHB
3311.4

Ms. Katherine McGuire
McGuire Law Offices
770 James Street, Suite 141B
Syracuse, New York 13203

Dear Ms. McGuire:

This refers to your letter of October 27, 1992, regarding a device described as a "bolt actuated trigger" (B.A.T.) and submitted sample which you provided for our examination.

As defined in 26 U.S.C. § 5845(b) the term machinegun means any weapon which shoots, is designed to shoot, or can be readily restored to shoot, automatically more than one shot, without manual reloading by a single function of the trigger. The term shall also include....any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machinegun.

The submitted sample "bolt actuated trigger" is a length of teflon coated steel cable, approximately 23 inches in length having a loop at each end and a threaded coupling at the center. As described, the device is specifically designed for one end to be attached to the cocking handle of a semiautomatic rifle and the opposite end is to be attached to the buttstock. The central portion is looped around the original trigger.

When the "bolt actuated trigger" is attached to a semiautomatic firearm as described, hand pressure against side of the cable will cause the firearm to discharge. Rearward movement of the bolt will cause the cable to slacken. Forward movement of the bolt will cause the weapon to fire again. The weapon will fire repeatedly until hand pressure is released from the cable.

CODE	INITIATOR	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER
	LE:F:TE	LE:F:TE					
SUR-NAME	Bullard	Over					
DATE	11/27/92	11/27/92					

-2-

Ms. Katherine McGuire

Based upon our examination and the information which you provided, the "bolt actuated trigger" is an auxiliary trigger mechanism which is specifically designed and intended for use in converting a semiautomatic rifle into a machinegun; therefore, it is held to be a firearm and a machinegun as defined.

It is unlawful for any person to make, possess, or transfer a machinegun which is not registered in accordance with the provisions of the National Firearms Act (26 U.S.C. Chapter 53). Since we are unable to establish that the submitted sample was manufactured and transferred in accordance with the provisions of 26 U.S.C. Chapter 53 and 18 U.S.C. § 922(o), we are unable to return it to you.

Disposition may be made of the submitted specimen by abandoning it to the Bureau of Alcohol, Tobacco and Firearms. If instructions from you concerning the lawful disposition of this firearm are not received within 60 days, forfeiture proceedings will be initiated to enable the Government to dispose of this item.

We regret that our response in this matter has not been more favorable. If you have further questions, please contact us.

Sincerely yours,

Edward M. Owen, Jr.
Chief, Firearms Technology Branch

CODE	INITIATOR	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER
SUR-NAME							
DATE							

McGUIRE LAW OFFICES

770 JAMES STREET, SUITE 141B
SYRACUSE, NEW YORK 13203

PATENT, TRADEMARK & COPYRIGHT MATTERS

CHARLES S. McGUIRE
KATHERINE McGUIRE

REGISTERED PATENT ATTORNEYS

TEL. NO.: (315) 471-0361
FAX NO.: (315) 479-7881

CAB
3-038

October 27, 1992

Mr. Edward Owen
Chief of Firearms Technology
Bureau of Alcohol, Tobacco & Firearms
650 Massachussets Ave. NW
Washington, D.C. 20226

Dear Mr. Owen:

I represent a client who has invented a bolt actuated trigger (B.A.T.) to be used with semi-automatic firearms. The B.A.T. does not convert the semi-automatic weapon into an automatic weapon by definition, but it does permit approximately 6-7 rounds/second to be fired from such a firearm. What we desire from BATF, and you in particular, is a ruling as to whether or not you consider this B.A.T. to be a legal modification of a semi-automatic firearm, and a statement confirming such ruling.

A prototype and photocopies of photographs are enclosed for your benefit to more fully understand the invention. Return of the prototype would be greatly appreciated, if at all possible.

The B.A.T. is simply a length of many fine strands of stainless steel having an outer layer of TEFLON® which acts as a protective cover and reduces friction between the B.A.T. and the firearm during use. Both ends of the B.A.T. include loops for attaching to the firearm in the manner described below. The strands of stainless steel provide great strength and flexibility to the B.A.T., while the TEFLON® coating provides a strong, protective covering for the stainless steel, as well as being substantially frictionless to provide smooth actuation of the trigger. Although these are the preferred materials to be used, any suitable material may be used. When utilizing the B.A.T. on a semi-automatic weapon (e.g., AK-47), the following sequence of steps are followed:

1. attach one end of the B.A.T. to the handle extending

ATF 0530

Mr. Edward Owen
Page 2
October 27, 1992

outwardly from the bolt;

2. loop the B.A.T. around the trigger of the firearm;
3. pull the B.A.T. towards the rear of the firearm until substantially all the slack is removed from the B.A.T.;
4. attach the free end of the B.A.T. to the rear of the firearm (or stand if firearm is mounted thereon), being sure to keep the B.A.T. taut;
5. cock the firearm to prepare to shoot;
6. slide your trigger hand between the B.A.T. and grip and push slightly outwardly against the B.A.T. which tensions the B.A.T. pulling the trigger. The bolt re-cocks itself and the B.A.T. tensions once again to pull the trigger again. As long as the person's trigger hand remains against the B.A.T., the weapon will continue firing in this manner until the cartridge is emptied.

The physics of the operation of the B.A.T. are very simple. After the gun is originally cocked and fired, the pressurized gas produced from the explosion is released in the chamber of the firearm and re-cocks the firearm. When the bolt slides backwards on the firearm, slack is produced in the B.A.T., thus allowing the trigger to return to its inactive position. When the bolt automatically returns to its frontal position (as it does with all semi-automatic weapons), the tension in the B.A.T. causes the trigger to automatically return to its active position, thus eliminating the need of the user to have a "quick trigger finger". The firearm remains semi-automatic in that only one shot is fired for every trigger pull, but also increase the rate at which rounds may be fired. It is a further advantage of this invention that for those who prefer to fire rapidly, accuracy is increased tremendously since their hands remain still while firing.

The enclosed photocopied sheet may further your understanding of the invention. A brief description of the figures is as follows:

Figure 1 is a side elevational view showing the B.A.T. connected to a semi-automatic firearm;

Figure 2 is a close-up, side elevational view showing the firearm being originally cocked with the B.A.T. being properly wrapped about the trigger and the user's hand (notice the slack that forms in the B.A.T.);

Mr. Edward Owen
Page 3
October 27, 1992

Figure 3 is a side elevational view showing the B.A.T. in its operational position with the person's trigger hand positioned between the B.A.T. and grip immediately prior to applying tension thereto to fire the weapon;

Figure 4 is a close-up, side elevational view of Figure 3 showing the hand in position ready to fire the weapon; and

Figure 5 is a plan view showing a second embodiment of the present invention. The only difference between the two embodiments is that the second embodiment is shorter and has means to directly attach to the user's finger instead of the rear of the firearm.

Your cooperation and attention in this matter are highly appreciated. If you have any questions/comments pertaining to this matter please call me at my office during normal business hours. Please send all correspondence to my attention at the address given above. Thank you once again for your cooperation.

Sincerely yours,


Katherine McGuire

KM/sd
encl.



FIGURE 4

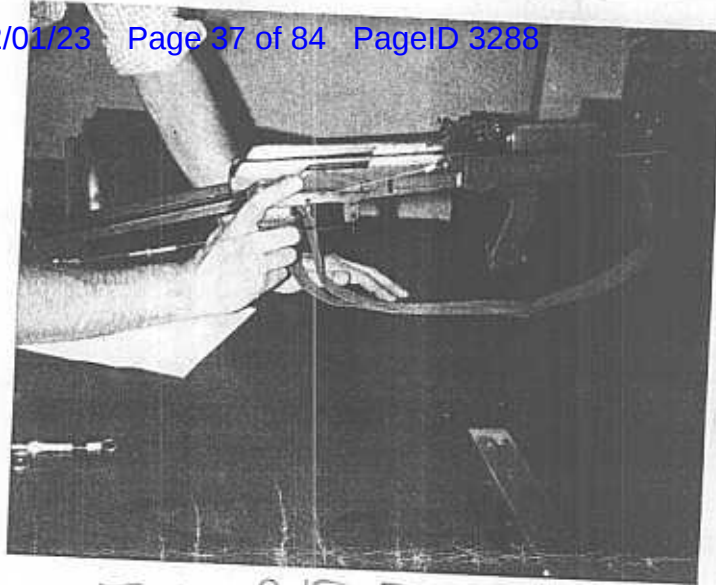


FIGURE 3

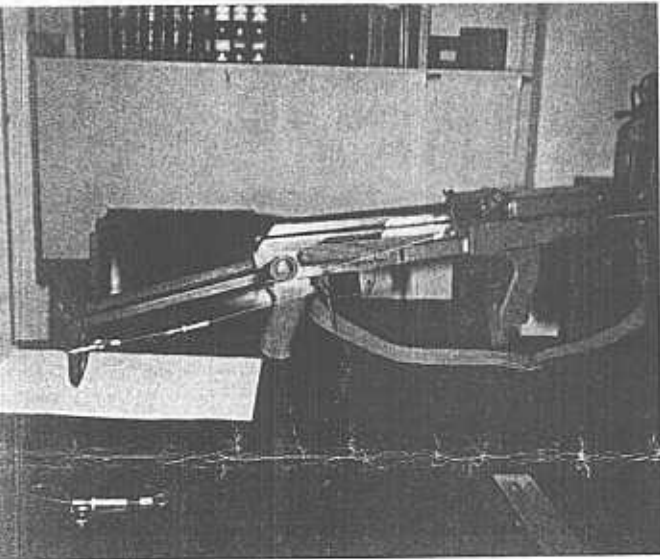


FIGURE 1



FIGURE 5

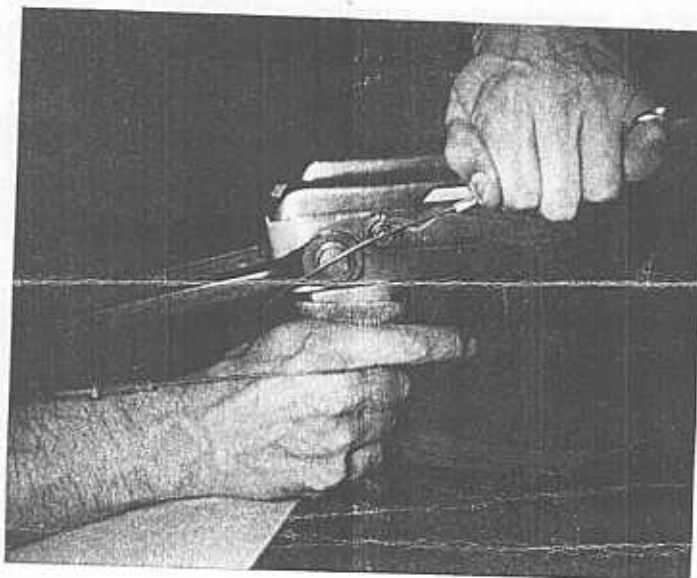


FIGURE 2



DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
WASHINGTON, D.C. 20226

APR - 4 1994

LE:F:TE:RLB
3312.5

[REDACTED]

Dear [REDACTED]:

This refers to your letter of recent date in which you request classification on a trigger attachment device which you have designed.

As defined in Title 26 United States Code (U.S.C.), Chapter 53, Section 5845(b), of the National Firearms Act (NFA), the term "machinegun" means any weapon which shoots, is designed to shoot, or can be readily restored to shoot automatically more than one shot, without manual reloading, by a single function of the trigger. The term shall also include the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machinegun, and any combination of parts from which a machinegun can be assembled if such parts are in the possession or under the control of a person.

It is unlawful for anyone to possess an NFA firearm which is not registered in accordance to the provisions of the NFA.

The sample device which you submitted is designed and intended to be installed on a Ruger, Model Mini-14, .223 caliber, semiautomatic rifle. The device consists of a combination of component parts which include the base, the arm, friction adjustment bolt, pivot, and the trigger shoe with trigger bar. The base of the device is inserted into the magazine well of the firearm and held in place by the magazine retainer latch. The arm of the sample device subsequently contacts the operating handle of the firearm, while the trigger shoe with trigger bar, contacts and covers the trigger of the firearm.

-2-

[REDACTED]

The submitted sample device was attached to a Ruger, Model Mini-14, .223 caliber, semiautomatic rifle which was obtained from the ATF Firearms Reference Collection. Test firing disclosed that when the sample device was attached, the ATF test weapon would fire a two-shot burst, without manual reloading, by a single function of the trigger. This condition was consistently reproduced.

Based on our examination, it is our opinion that the sample device is a combination of parts designed and intended for use in converting a firearm into a machinegun; therefore, it is a "machinegun" as that term is defined and subject to all the provisions and controls of the NFA.

We cannot return an NFA firearm to you unless it is registered to you in accordance with the provisions of the NFA. Since the subject device is not registered to you, it cannot lawfully be returned unless proper registration can be established.

To establish the registration you must become licensed as a manufacturer of machineguns and pay the required special occupational tax as a manufacturer of NFA firearms. Once you become properly licensed, registration of the device may be established by submitting the required ATF Form 2, Notice of Firearms Manufactured or Imported. However, the sale of the sample device or any machineguns which you manufacture would be restricted to only government and/or law enforcement sales.

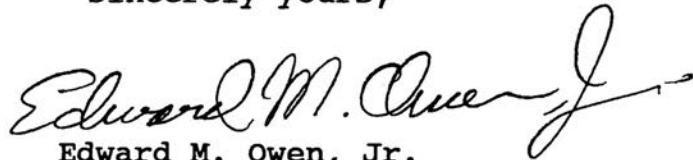
Alternatively, if you do not wish to become a licensed manufacturer, the only remaining option is voluntary abandonment of the sample device to ATF for disposition.

The sample device which you submitted will be retained by the Firearms Technology Branch pending your decision as to its disposition. If disposition instructions concerning the sample device are not received within 60 days, forfeiture proceedings will be initiated to enable the government to dispose of this property.

-3-

We trust that the foregoing has been responsive to your inquiry. If we may be of any further assistance, please contact us.

Sincerely yours,

A handwritten signature in black ink, reading "Edward M. Owen, Jr." with a stylized flourish at the end.

Edward M. Owen, Jr.
Chief, Firearms Technology Branch

4-336 RLB

DEAR SIRs,

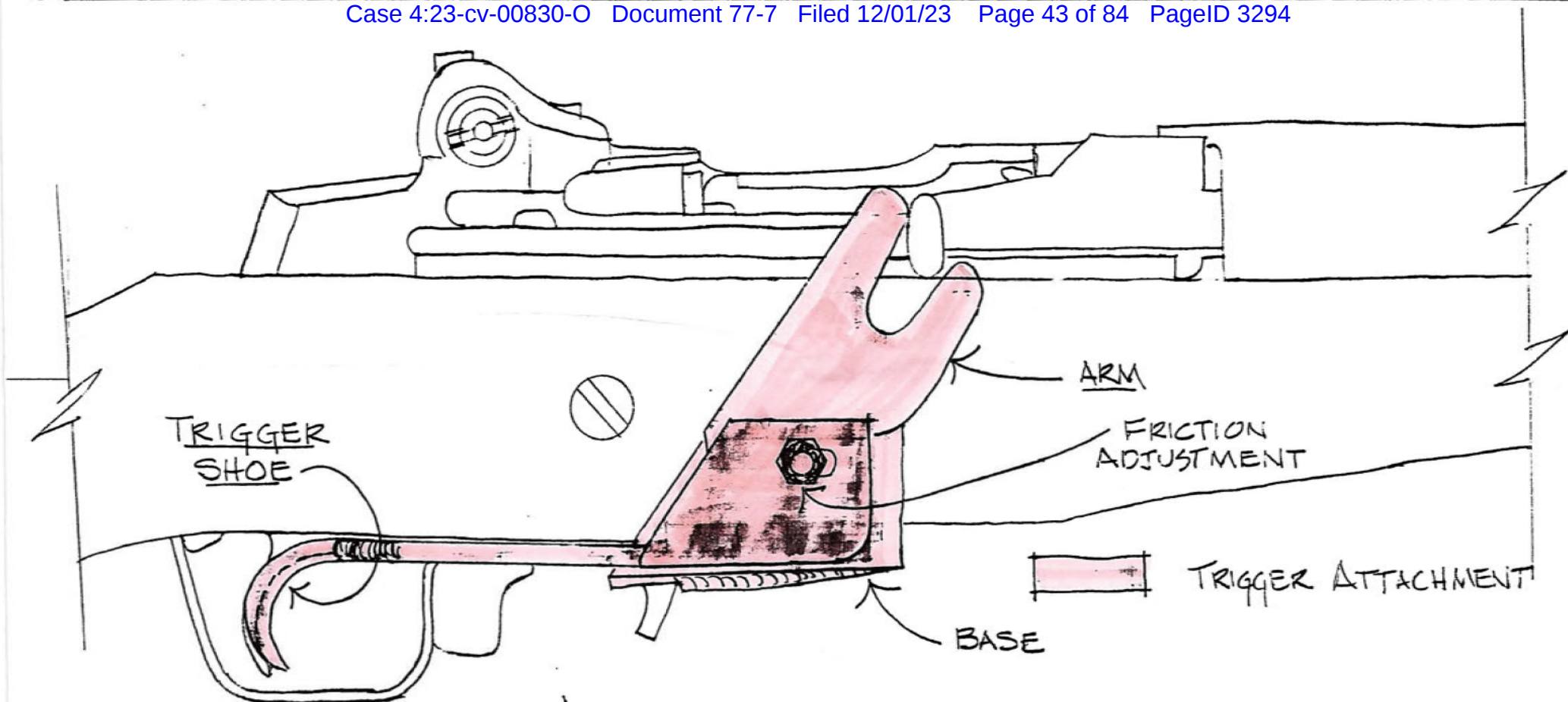
PLEASE FIND ENCLOSED A TRIGGER ATTACHMENT I AM SUBMITTING FOR YOUR CLASSIFICATION IN ACCORDANCE WITH THE NATIONAL FIREARMS ACT. I DO INTEND TO APPLY FOR A PATENT AND MANUFACTURE THE DEVICE IF ALLOWABLE PER THE NFA. THIS DESIGN WILL BE ALTERED BEFORE ACTUAL MANUFACTURE, IF ANY, BUT THE OPERATION WILL BE IDENTICAL. THE REVISED DESIGN IS ONLY ON PAPER AT THIS TIME HOWEVER. OF COURSE, THE DESIGN IS INTENDED TO BE ADAPTABLE TO OTHER SEMI-AUTO WEAPONS AND I WOULD PURSUE THAT QUITE SOON IF THE SAMPLE SUBMITTED IS ACCEPTED IN PRINCIPLE AS NOT BEING FULL AUTOMATIC OPERATION. I APOLOGIZE FOR THE HAND WRITTEN LETTER AND FREEHAND SKETCH / DESCRIPTIONS (ATTACHED) BUT I AM RESOURCE LIMITED (AND ANXIOUS TO HEAR THE VERDICT). IF I CAN BE OF ANY ASSISTANCE PLEASE CALL ME AT [REDACTED] OR [REDACTED] [REDACTED]. MY ADDRESS IS:

[REDACTED]

THANK YOU FOR YOUR TIME AND CONSIDERATION
IN THIS MATTER. I WOULD ALSO LIKE TO
OBTAIN A BATF ADDRESS/PHONE N° TO
CONTACT CONCERNING SEVERAL OTHER
OF MY DESIGNS. SPECIFICALLY, I WANT
TO MAKE A PROTOTYPE SEMI-AUTO PISTOL
AND ALSO A PROTOTYPE OF A "GATLING" STYLE
GUN (TO RESEARCH SOME CONCEPTS THAT
COULD HAVE MILITARY SALES POTENTIAL
AS MACHINE GUN IMPROVEMENTS)

THANK YOU,





APPEARANCE OF DEVICE ATTACHED
TO RUGER MINI-14

FIGURE 1

INSTALLATION :

1. OPEN AND LOCK BACK MINI-14 ACTION
2. REMOVE MAGAZINE
3. HOLD DEVICE UNDER WEAPON ROUGHLY IN THE POSITION SHOWN IN FIG.1.
LAY TRIGGER SHOE ON TRIGGER.
INSERT BASE UPWARD INTO MAGAZINE WELL .DEVICE WILL LATCH INTO POSITION UTILIZING EXISTING MAGAZINE LATCH.
MANIPULATE ARM TO INSURE TRIGGER SHOE IS CAPTIVE ON TRIGGER.
BE CARE FULL NOT TO BEND DEVICE WHILE INSTALLING.
4. ROTATE ARM COUNTER CLOCKWISE TO ITS FULL AFT POSITION. DONT FORCE.
5. INSERT MAGAZINE
6. RELEASE BOLT. (FORWARD BOLT TRAVEL SHOULD ENGAGE ARM PULLING IT FORWARD TO APPEAR AS IN FIG.1)
7. WEAPON CAN NOW BE FIRED

OPERATION :

- (1) THE DEVICE OPERATES BY PULLING THE TRIGGER FINGER FORWARD AFTER EACH SHOT IS FIRED IN NORMAL SEMI-AUTO MODE. THE DEVICE ACTS TO PREVENT REARWARD TRIGGER MOTION SUFFICIENT TO FIRE THE WEAPON UNTIL A TIME AFTER THE BOLT IS FORWARD, CLOSED AND, LOCKED. THIS IS ACCOMPLISHED BY INTERPOSITION/ACTION BY THE TRIGGER SHOE BETWEEN THE TRIGGER FINGER AND TRIGGER. WITH EACH SHOT THE TRIGGER IS RELEASED AND RETURNS FORWARD VIA ITS OWN INTERNAL SPRING. A MANUAL TRIGGER PULL TO REAR IS THEN REQUIRED FOR EACH SHOT OF THE WEAPON EXACTLY AS IN NORMAL SEMI-AUTO OPERATION.
- (2) TO SIMULATE ACTION OF DEVICE THE FOLLOWING IS SUGGESTED:
 - (a) INSTALL DEVICE AS FOR FIRING EXCEPT USE AN EMPTY MAGAZINE WITH THE FOLLOWER DEPRESSED. (TO PREVENT BOLT HOLD OPEN)

(2) CONT.

(b) CYCLE BOLT HANDLE WHILE APPLYING PRESSURE TO TRIGGER BY TRIGGER FINGER.

(c) OBSERVE HAMMER FALL (IF PRESSURE IS PLACED ON TRIGGER) AS BOLT IS ENDED FORWARD AND ROTATES TO LOCK.

(3) I DON'T THINK THIS DEVICE ALTERS THE FUNCTION OF THE WEAPON, NOR CAN MORE THAN A SINGLE SHOT BE FIRED FOR A SINGLE TRIGGER PULL.



DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
WASHINGTON, D.C. 20226

LE:F:TE:RLB
3311.4

APR 26 1994



Dear [REDACTED]

This refers to your letter of April 12, 1994, in which you request that we reconsider our recent determination on a certain trigger attachment device which you submitted for classification.

As defined in Title 26 United States Code (U.S.C.), Chapter 53, Section 5845(b), of the National Firearms Act (NFA), the term "machinegun" means any weapon which shoots, is designed to shoot, or can be readily restored to shoot automatically more than one shot, without manual reloading, by a single function of the trigger. The term shall also include the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machinegun, and any combination of parts from which a machinegun can be assembled if such parts are in the possession or under the control of a person.

The sample device which you submitted was examined by technicians, which are assigned to this office. It was determined that the device is powered by the firearm's operating rod or handle and it incorporates a design which substitutes the trigger (i.e. trigger shoe) of the device for the trigger of the weapon. The sample device was attached to a Ruger, Mini-14, semiautomatic rifle, which when test fired, was capable of firing automatically more than one shot by a single function of the trigger. This condition was consistently reproduced.

As a result of the test firing conducted and because of the design of the device, it is determined and affirmed that the sample device is a combination of parts which are designed and intended for use in converting a weapon into a machinegun; therefore, it is a "machinegun" as that term is defined above.

-2-

In the second-half of your letter you request information necessary for you to obtain a license which would allow you to manufacture weapons which are subject to the NFA. For information regarding the appropriate licensing, you will need to contact the following office:

Bureau of Alcohol, Tobacco and Firearms
Firearms and Explosive Licensing Center
Post Office Box 2994
Atlanta, Georgia 30301

For additional information concerning NFA requirements,
contact the following office:

Bureau of Alcohol, Tobacco and Firearms
Chief, NFA Branch, Room 5300
650 Massachusetts Avenue, NW.
Washington, DC 20226

ATF F Form 7 and Form 5630.7 are enclosed for your convenience.

The sample device which you previously submitted will continue to be retained by this office pending your decision as to its disposition.

We regret that we are unable to respond more favorably at the present time. If you have further questions concerning this matter, please contact us.

Sincerely yours,

Edward M. Owen, Jr.
Edward M. Owen, Jr.
Chief, Firearms Technology Branch

Enclosures

ATF 0544

4-404 RLB

[REDACTED]

April 12, 1994

Mr. Edward M. Owen, Jr.
Department of the Treasury
Bureau of Alcohol, Tobacco and Firearms
650 Massachusetts Avenue, NW
Washington DC 20226

Dear Mr. Owen:

This is in response to your letter of April 4, 1994, that provided NFA classification action I requested on a submitted trigger device. Your letter advised that in your opinion the device submitted is a NFA machine gun. The sole reason stated for that decision was; "Test firing disclosed that when the sample device was attached, the ATF test weapon would fire a two-shot burst, without manual reloading, by a single function of the trigger." Because the device was primarily designed to not do what you describe as having occurred, I would like for you to reconsider the classification or at least your stated basis.

To elaborate I offer the following rational: I can easily understand how you might have reached your conclusion. I designed this device to allow (but not cause) a person to fire a semi-automatic weapon very rapidly. It truly mimics the effect of a machine gun but, I believe, not its function. Being somewhat familiar with the statutory machine gun definition, I carefully tried to ensure it could not be classified as one. The operating principle of this device is probably very different than any you may have encountered before, and it is also the basis for my pending patent application.

In operation, as I described in my submission letter attachment, the sole function of the device is to return the trigger finger forward to the ready to fire position, and to restrain the trigger finger in that position until such time that the weapons action is closed and locked. At this time in the firing cycle the trigger will be in its full forward position, and the mechanism will unrestrain the trigger bar/shoe. The trigger may now be pulled to the rear by manual operation to fire the weapon. There must be a manual rearward pull exerted on the trigger to fire each and every shot, and without it none will be fired.

The function of the weapon is identical with or without the device attached. Physical manipulation of the attached device, as I described in my submission letter attachment, can substantiate what I have described here. The device is merely a "gate" or "timing mechanism" that allows the trigger to be operated, only after the earliest moment that such action can fire the weapon. When the device is operating it does no more than to prevent the operator from pulling the trigger when it would not fire the weapon. Single shots may still be fired. From this description you can see why I must take exception to your description of a two-shot burst with a single function of the trigger. It would be virtually impossible for any person to hold the trigger in the rearward position. If it was done, the gun would cease to fire until the spent casing would be ejected and a new round chambered.

The device does allow rapid semi-automatic firing that could theoretically approach automatic rates of fire. So does the approved "Hellfire" device, and several others. In any event, a high speed camera would demonstrate a distinctly separate manual trigger pull must, and does, precede each and every firing of the weapon, (as it does in any normal semi-automatic weapon). I do appreciate that there is a great emotionalism surrounding firearms at this time, but as I understand the statutes there is no reference to a maximum allowable rate of fire.

I would like to hold in abeyance my decision regarding disposition of the submitted sample device for the time being. I will, however, respond in plenty of time to avoid causing your office to begin forfeiture proceedings as you advised in your letter.

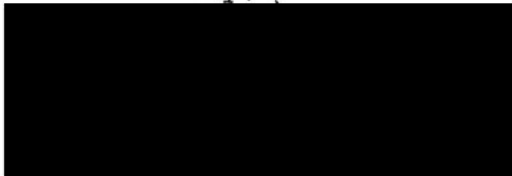
At your earliest convenience, please forward the forms necessary for me to obtain a NFA firearms (and other firearms) manufacturing license, along with whatever other pertinent information that may be available.

At the time I received your letter of classification I possessed two operable prototypes, and some miscellaneous components that did not function. For your information; I have cut the two prototypes, rendering them unusable for any purpose. They could only be made to operate if reconstructed by welding, and if the dimensions necessary are known. No functional assemblies can be created from the remaining components, because they never did work.

Please consider this request for classification reconsideration of the submitted sample. If you still consider the device to be a machine gun by statute, I would like to enter into some discussion with you on how I might redesign this device to obtain non-NFA classification.

Thank you very much for your attention and responsiveness to my requests. Please advise me if I can be of any help in this matter. I will certainly comply with any direction you may provide, to assure I do not violate any laws. If I may, I will continue to seek your guidance in the future.

Sincerely, .





DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
WASHINGTON, D.C. 20226

JUN - 8 1994

LE:F:TE:RLB
3311.4

Dear [REDACTED] [REDACTED]

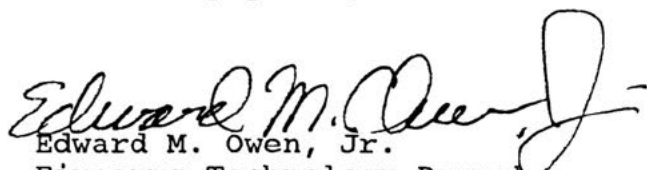
This refers to your letter of May 17, 1994, in which you inquire about the trigger attachment with was recently classified as a machinegun by this office.

As defined in Title 26 United States Code (U.S.C.), Chapter 53, Section 5845(b), of the National Firearms Act (NFA), the term "machinegun" means any weapon which shoots, is designed to shoot, or can be readily restored to shoot automatically more than one shot, without manual reloading, by a single function of the trigger. The term shall also include the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machinegun, and any combination of parts from which a machinegun can be assembled if such parts are in the possession or under the control of a person.

Classifications and determinations concerning firearms under the Federal firearms laws are made by Bureau technicians who are recognized experts in the firearms field and after necessary consultation with attorneys in our office of Chief Counsel. We regret that you do not agree with our decision; however, we are confident that the classification given your device is accurate and appropriate.

We regret that our response in this matter has not been more favorable. If you have further questions, please contact us.

Sincerely yours,


Edward M. Owen, Jr.
Chief, Firearms Technology Branch

ATF 0548

B4B

4-458

May 17, 1994



Mr. Edward M. Owen, Jr.
Department of the Treasury
Bureau of Alcohol, Tobacco and Firearms
650 Massachusetts Avenue, NW
Washington DC 20226

Dear Mr. Owen:

This refers to your letter of 26 April, 1994, which confirms your previous classification of the trigger attachment I submitted.

Because the referenced letter did not provide the rationale I requested of you, to support your previously provided device classification; I still contend your analysis is flawed, or at least based on a very strained interpretation of the meaning of the words "single function of the trigger". I continue to believe that the NFA Section 5845b is not applicable to the submitted device.

Proper classification of the rifle with my device installed is that of a rifle (not a machine gun). A rifle by NFA definition will "...fire only a single projectile through a rifled bore for each single pull of the trigger...". A rifle with my device attached still meets this same definition, and thus my device is not classifiable per NFA. It is literally impossible for a device to be a machine gun by NFA definition unless it is capable of firing more than one shot with a single function of the trigger. My device does not possess this capability; again making it non-classifiable per NFA. I have explained this in great detail and solicited your explanation of your classification, but on this, my main point, you have chosen to remain silent. I continue to solicit your explanation for what appears to me to be a wholly unjustified classification, that is only supported by a false contention that has no physical, or rational basis in fact.

This device was developed in full awareness of the NFA definition of "machine gun" and, accordingly, I insured that it could never, fire more than one shot with a single function of the trigger. Your office has twice stated in correspondence (4 April, and 26 April, 1994) that you have been able to cause the device to fire more than one shot with

ATF 0549

a single function of the trigger. How this could be so, is beyond my comprehension, and I would like to know how you did it. Could you please explain that part?

Please advise me if your office denies that there is a unique single rearward manual motion of the trigger for each and every shot fired with my device installed. If your office declines to address this question I will appreciate that you do understand this aspect of the design, and do not deny that this is the very way it functions, in fact.

I believe that your actions must not be arbitrary, and must be based on the law, as it is written. If that is the situation, then the only logical explanation I can imagine for our disagreement is that your office is using some definition of the terminology "...single function of the trigger..." that I am not aware of. For the sake of expediency in this matter, I therefore request I be provided with your definition of "...single function of the trigger..." as utilized in the subject classification. I need to understand how and why your office reached its conclusion. I could easily accept your classification if logical rationale had been provided - but it has not. If none can be provided then the classification has to be based on something other than the law, as I see it.

I emphatically protest several statements from your 26 April, 1994 letter and especially the fourth paragraph which states; "...it is determined and affirmed that the sample device is a combination of parts which is designed and intended for use in converting a weapon into a machine gun..." Contrary to your statement the device was not "intended" or "designed" for any such use. In any case, the statement could only be true if your contention that a single function of the trigger fires more than one shot is also true. By any commonly understood idea of "single function of the trigger" I believe I can prove that your analysis is false.

Just so there is no misunderstanding of my position in this regard, I reiterate from my 12 April, 1994 letter; I designed this device to allow (but not cause) a person to fire a semi-automatic weapon very rapidly. I designed the device to be outside of the literal NFA definition of "machine gun". I am a designer and engineer and I intend to continue my effort to arrive at some device design which will achieve maximum manual rate of fire from a combination of parts to which the NFA does not apply.

While this matter, at least to me, remains an open issue, I request that an extension of time be granted before you begin forfeiture proceedings. I further request that I be kept informed as to any actions you may take with respect to any such proceedings. In the interim; I am dissatisfied with

your classification and do not intend to voluntarily abandon my rights to the subject device.

Please advise me of any rights I might have with regard to either hearings, appeals, etc., of the device classification you have made.

Unless I receive some explanation to support your classification I have to consider that its imposition is unduly beyond the letter of the law and therefore overly restrictive. I will cooperate in every way possible and I will respect the decisions of your office but I remain in disagreement with your opinion, thus far; technically, logically, and legally.

Thank you for your efforts and timeliness in responding to my requests in this matter.

Sincerely,

A large black rectangular redaction box covers the signature area, obscuring the name and any handwritten notes.



U.S. Department of Justice

Bureau of Alcohol, Tobacco,
Firearms and Explosives

SEP 16 2004

903050:RV

3311/2004-272

www.atf.gov

Dear [REDACTED]

This refers to your correspondence, including accompanying illustrations and other items, and firearm sample submitted to the Firearms Technology Branch (FTB), Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). In your inquiry, you requested an evaluation of the design of this new firearm prior to manufacturing it. Specifically, you asked FTB to determine whether this firearm would be classified as a machinegun.

The sample you submitted is an AR 15 clone featuring a new design for the firing mechanism. This design would enable the firing mechanism to operate in the following manner as soon as the trigger is pulled:

- The hammer falls, firing a shot.
- The hammer is recoiled when the bolt comes to the rear.
- When the bolt travels forward, it contacts the cam (new design: see illustration).
- The forward pressure of the bolt against the cam forces the trigger forward.
- The continuous steady pressure on the trigger from the trigger pull causes the trigger to travel rearward and releases the cocked hammer, enabling firing to continue.
- The weapon ceases firing when the firing finger is physically removed from the trigger. (If the steady pressure of the trigger pull is not released, the weapon will continue to fire until the magazine is empty or a malfunction occurs.)

As defined in the National Firearms Act (NFA), 26 U.S.C. Section 5845(b), the term "machinegun" designates, in part, "... any weapon which will or is designed or can be readily restored to fire more than one shot automatically without manual reloading by the single function of the trigger."

Based on a careful review of your sample and plans, including the illustrations, FTB has determined that the submitted firearm is a "machinegun," being capable of firing automatically with a single function of the trigger. Our Branch reached this finding because it is evident

-2-

[REDACTED]

that from the moment of the application of trigger pressure--and as long as rearward pressure is applied to the trigger--the firearm continues to fire until the firing finger is removed; this firing takes place regardless of the cam's pushing the trigger forward.

With regard to the ATF Form 2 (Notice of Firearms Manufactured or Imported) that was submitted with your sample mechanism, FTB has forwarded it to ATF's NFA Branch.

Also, we are enclosing a copy of a photograph you submitted with your correspondence.

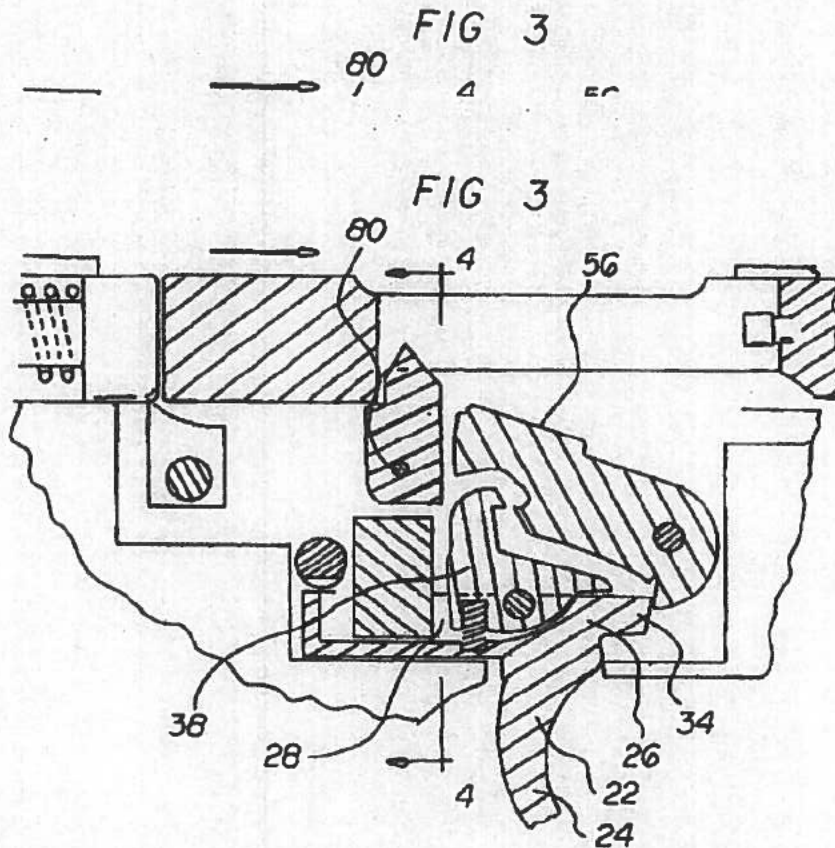
We trust that the foregoing has been responsive to your inquiry. If you have further questions concerning this matter, please contact us.

Sincerely yours,


Sterling Nixon
Chief, Firearms Technology Branch

Enclosure

ATF 0553



Figures 1, 2, and 3 (attached) illustrate the following points in the firing sequence in the *new firearm*:

Fig. 1 Trigger has been pulled for the first time, the hammer has fallen, but the recoil cycle has not yet begun.

Fig. 2 Bolt carrier has moved nearly fully rearward, actuating the cam, and forcing the trigger to the un-pulled position.

Fig. 3 Bolt carrier has just reached battery and has rotated the cam in the reverse direction thereby removing the impediment to the trigger and allowing the operator to once again pull the trigger.

RV



12-21-2003

2004-273-RV

Sterling Nixon
Chief, Firearms Technology Branch
Bureau of Alcohol, Tobacco, Firearms, and Explosives
650 Massachusetts Avenue, Room 6450
Washington, DC 20226

Chief Nixon:

I am writing to request an opinion regarding the legal status of a new firearm design. The document that follows will describe the design of the proposed firearm and is accompanied by drawings to help clarify the meaning of the description.

I have been advised by competent legal counsel that the firearm design described herein is not a machine gun by any definition under Federal Law. Absent some communication from you to the contrary, or some communication which indicates that a period of time in excess of 90 days is required to review this sample, it would be my intent to manufacture the herein described firearm as a Title I firearm to be sold in the means and channels of commerce customary to such an item.

The proposed firearm is mechanically similar to an AR15 style firearm but is a new design that I will simply refer to as the *new firearm* throughout the remainder of this document. The similarity to an AR15 style firearm is mentioned to help one who is familiar with the AR15 to better understand the drawings.

The *new firearm* incorporates a means whereby the rearward movement of the bolt carrier (as a result of the firearm being discharged) causes the rotation of a cam that forces the rear of the trigger downward, thereby pivoting the trigger about its axis, effectively moving the external portion of the trigger forward into the un-pulled position against the operator's trigger finger force. The cam is designed in such a way that after being rotated and forcing the trigger forward into the un-pulled position, the trigger is statically held there during the rearward and then forward travel of the bolt carrier. As the bolt carrier returns to battery, the trailing edge of the bolt carrier again engages the cam and rotates the cam in the opposite direction, which ceases the cam's engagement with the trigger extension thereby allowing the operator to pull the trigger again. It is important to note that no discharge of the firearm occurs during the displacement of the trigger by the cam. In fact, the cam absolutely precludes discharge of the firearm during its action.

The primary benefit of the *new firearm* is that it is physically impossible to pull the trigger faster than it is mechanically safe to do so. Further, it is possible to pull the trigger as soon as it is mechanically safe to do so affording the operator an increased rate of fire while preserving the principle of "one round discharged per function of the trigger". With the AR15 rifle (from which the *new firearm* evolved) it is mechanically possible to pull the trigger before the point when the bolt carrier has reached battery but after the point when

received
DEC 29 2003

ATF 0555

the disconnecter would prevent the hammer from falling. In the best possible scenario this results in a light primer hit and a stoppage, in the worst-case scenario this could result in an out of battery discharge.

Figures 1, 2, and 3 (attached) illustrate the following points in the firing sequence in the *new firearm*:

- Fig. 1 Trigger has been pulled for the first time, the hammer has fallen, but the recoil cycle has not yet begun.
- Fig. 2 Bolt carrier has moved nearly fully rearward, actuating the cam, and forcing the trigger to the un-pulled position.
- Fig. 3 Bolt carrier has just reached battery and has rotated the cam in the reverse direction thereby removing the impediment to the trigger and allowing the operator to once again pull the trigger.

Several components of the *new firearm* are essentially identical to an AR15 style firearm. The components that are newly designed are:

Lower receiver, hammer, trigger, disconnecter, bolt carrier, trigger extension, and cam.

The principal differences between those components in an AR15 style firearm and those in the *new firearm* are:

- Lower receiver Hole provided for pivot pin for cam. Hole is not in the same location as the auto-sear hole in an M16 receiver. It is positioned further forward so as to preclude use of M16 fire control components. It is also larger in diameter than an M16 auto-sear hole.
- Hammer The hammer is of a bobbed style similar to those found in some 9mm variants and as seen in "low mass" hammers. The bobbed hammer provides additional room in the rear of the lower receiver for the cam and trigger extension. The notch on the face of the hammer is retained in order to allow binding with the firing pin if the cam and disconnecter were removed.
- Trigger The trigger has a disconnecter spring pocket that is further forward than in an AR15 to accommodate the redesigned disconnecter, which provides additional room in the rear of the receiver for the cam and trigger extension.
- Disconnector The disconnecter has no "tail" at all compared to an AR15 disconnecter, and has a spring notch that is further forward corresponding to the pocket in the trigger. The mechanical function of the disconnecter is unchanged from the AR15.
- Bolt Carrier The bolt carrier possesses a "machined away" area under the firing pin collar as the AR15 does (to preclude a runaway if the disconnecter and cam are removed), but has a trailing rear surface that extends further forward than most AR15 carriers,

but not so far forward as an M16. The trailing rear surface of the bolt carrier in the *new firearm* is specifically designed not to be able to trip an M16 auto-sear, and to preserve the safety benefits of an exposed firing pin collar as in the AR15.

Trigger Extension The trigger extension bridges the gap between the cam and the rear of the internal portion of the trigger. This allows the rotation of the cam to transmit displacing force to the trigger.

Cam The cam is designed so as to be rotated toward the rear on rearward travel of the bolt carrier and in doing so forces the trigger forward by means of contact with the trigger extension. Subsequently, upon the bolt carrier returning to battery, the cam is rotated forward thereby ceasing its force against the trigger extension allowing the operator to pull the trigger again.

Principle design goals were:

- To ensure that a single function of the trigger results in a single discharge of the firearm.
- Enhancement of the shooting experience and of the safety of the firearm.
- To make the *new firearm* at least as difficult to be illegally converted into a machine gun as it's AR15 predecessor, if not more difficult.

You are requested to confirm counsel's opinion that the *new firearm* is not legally a machine gun under Federal Law. Every effort has been expended in designing the new firearm to ensure that it does not run afoul of any Federal machine gun definitions. In the event that you find the enclosed firearm to be a machine gun, an executed ATF Form 2 is enclosed in a separate envelope for this firearm. If you determine the firearm is not a machine gun, please destroy the Form 2. If you determine the firearm is a machine gun, please forward the Form 2 to the NFA Branch for processing.

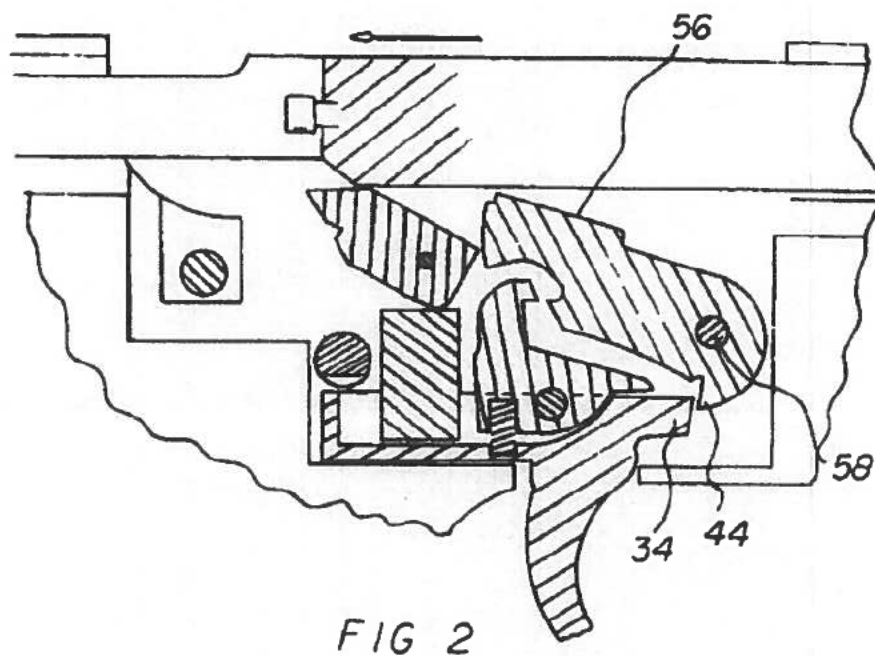
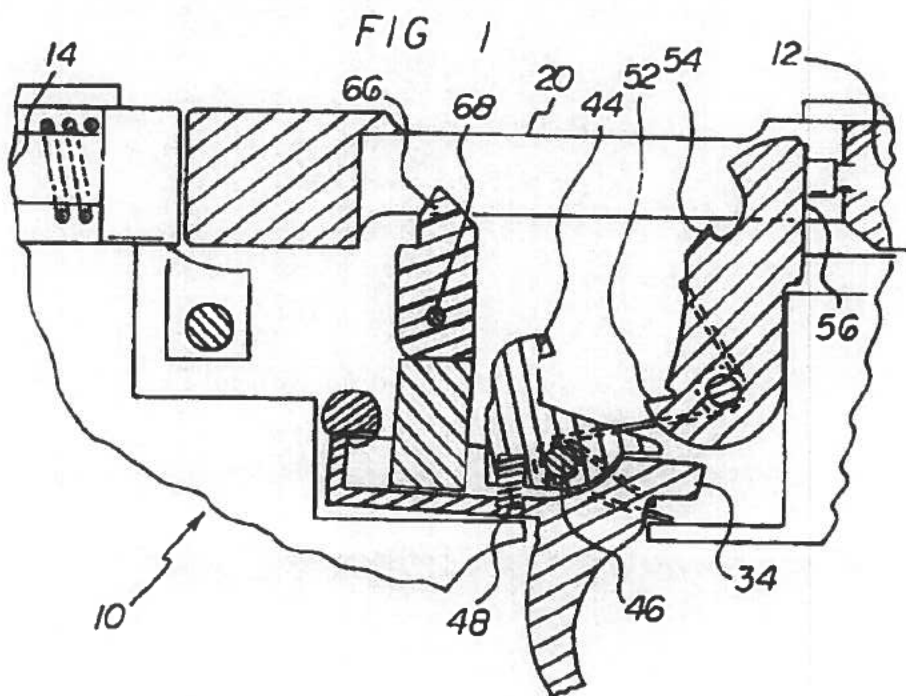
Thank you for your time in reviewing this request.

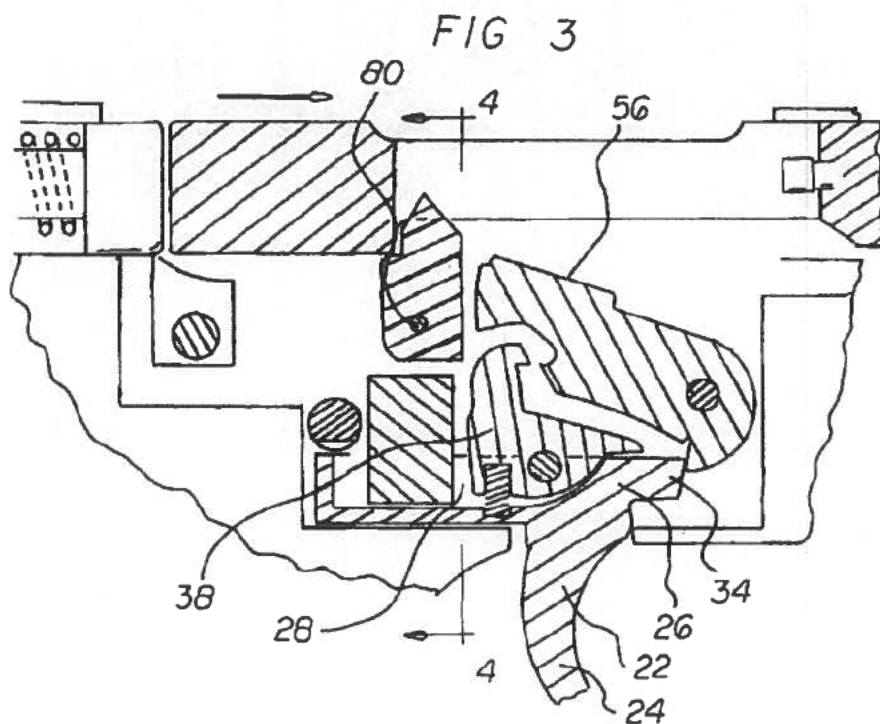
Sincerely,



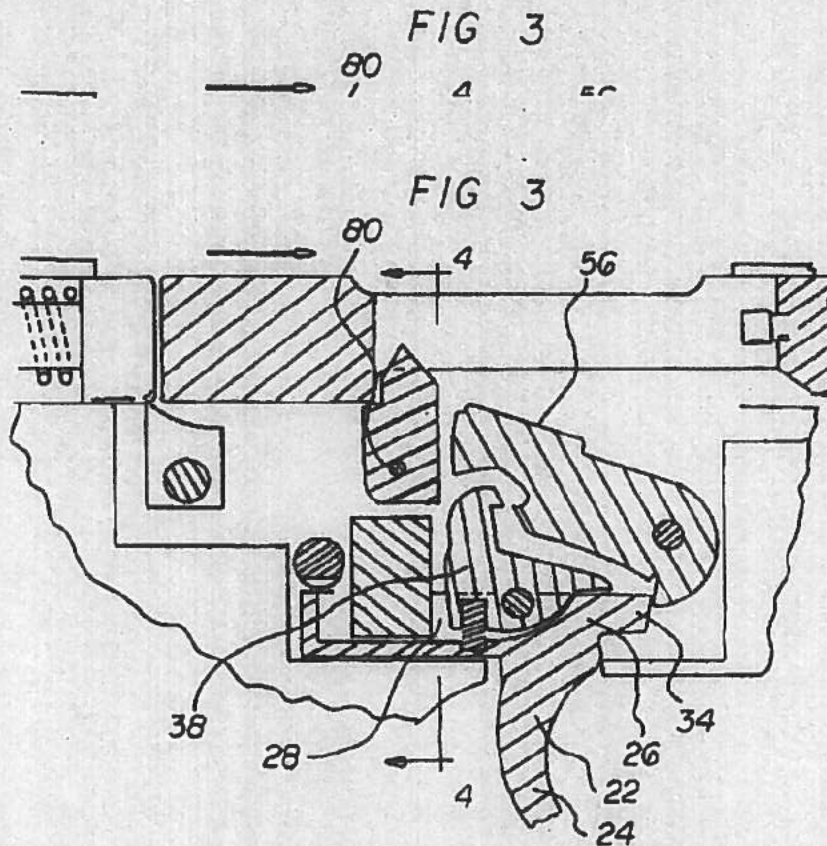
Enclosure: AR16 firearm serial number ATF0001
Completed ATF 5320.2 (Form 2) in separate envelope
Figures 1 through 3

"AR16" TM (Trademark) [REDACTED]
Design of enclosed firearm is Patent Pending





DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
CORRESPONDENCE APPROVAL AND CLEARANCE



Figures 1, 2, and 3 (attached) illustrate the following points in the firing sequence in the new firearm:

Fig. 1 Trigger has been pulled for the first time, the hammer has fallen, but the recoil cycle has not yet begun.

Fig. 2 Bolt carrier has moved nearly fully rearward, actuating the cam, and forcing the trigger to the un-pulled position.

Fig. 3 Bolt carrier has just reached battery and has rotated the cam in the reverse direction thereby removing the impediment to the trigger and allowing the operator to once again pull the trigger.

	INITIATOR	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER
CODE	903050	903050	903050	903050			
SURNAME							
DATE							

Sand,

Sand THIS OUT
HOW
PEDEY

(A)



Fedex'd
9/16/04
g

DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
CORRESPONDENCE APPROVAL AND CLEARANCE

903050:RV
 3311/2004-273

Dear [REDACTED]:

This refers to your correspondence, including accompanying illustrations and other items, and firearm sample submitted to the Firearms Technology Branch (FTB), Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). In your inquiry, you requested an evaluation of the design of this new firearm prior to manufacturing it. Specifically, you asked FTB to determine whether this firearm would be classified as a machinegun.

The sample you submitted is an AR 15 clone featuring a new design for the firing mechanism. This design would enable the firing mechanism to operate in the following manner as soon as the trigger is pulled:

- The hammer falls, firing a shot.
- The hammer is recoiled when the bolt comes to the rear.
- When the bolt travels forward, it contacts the cam (new design: see illustration).
- The forward pressure of the bolt against the cam forces the trigger forward.
- The continuous steady pressure on the trigger from the trigger pull causes the trigger to travel rearward and releases the cocked hammer, enabling firing to continue.
- The weapon ceases firing when the firing finger is physically removed from the trigger. (If the steady pressure of the trigger pull is not released, the weapon will continue to fire until the magazine is empty or a malfunction occurs.)

As defined in the National Firearms Act (NFA), 26 U.S.C. Section 5845(b), the term "machinegun" designates, in part, "... any weapon which will or is designed or can be readily restored to fire more than one shot automatically without manual reloading by the single function of the trigger."

Based on a careful review of your sample and plans, including the illustrations, FTB has determined that the submitted firearm is a "machinegun," being capable of firing automatically with a single function of the trigger. Our Branch reached this finding because it is evident

	INITIATOR	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER
CODE	903050	903050	903050	903050			
SURNAME		<i>MINTZ</i>	<i>Uasand</i>				
DATE		9-15-04	9-15-04				

ATF 0562

DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
CORRESPONDENCE APPROVAL AND CLEARANCE

[REDACTED]

that from the moment of the application of trigger pressure--and as long as rearward pressure is applied to the trigger--the firearm continues to fire until the firing finger is removed; this firing takes place regardless of the cam's pushing the trigger forward.

With regard to the ATF Form 2 (Notice of Firearms Manufactured or Imported) that was submitted with your sample mechanism, FTB has forwarded it to ATF's NFA Branch.

Also, we are enclosing a copy of a photograph you submitted with your correspondence.

We trust that the foregoing has been responsive to your inquiry. If you have further questions concerning this matter, please contact us.

Sincerely yours,

Sterling Nixon
Chief, Firearms Technology Branch

Enclosure

	INITIATOR	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER
CODE	903050	903050	903050	903050			
SURNAME							
DATE							

(12) **United States Patent**
Blakley

(10) **Patent No.:** **US 7,398,723 B1**
(45) **Date of Patent:** **Jul. 15, 2008**

(54) **TRIGGER FORWARD DISPLACEMENT
SYSTEM AND METHOD**

(76) Inventor: **Brian A. Blakley**, 8971 - 67th St. N.,
Pinellas Park, FL (US) 33782

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 516 days.

(21) Appl. No.: **10/424,676**

(22) Filed: **Apr. 25, 2003**

(51) **Int. Cl.**
F41A 19/02 (2006.01)

(52) **U.S. Cl.** **89/129.01**; 89/129.02; 89/130;
89/131; 42/69.01

(58) **Field of Classification Search** 42/69.01,
42/70.06; 89/128-131, 129.01, 129.02
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,023,465 A * 5/1977 Inskip 89/131
4,057,003 A * 11/1977 Atchisson 89/138
4,463,654 A * 8/1984 Barnes et al. 89/128
4,580,484 A * 4/1986 Moore 89/128

4,697,495 A * 10/1987 Beretta 89/143
4,787,288 A * 11/1988 Miller 89/27.3
5,614,691 A * 3/1997 Taylor 89/128
6,101,918 A * 8/2000 Akins 89/129.01

* cited by examiner

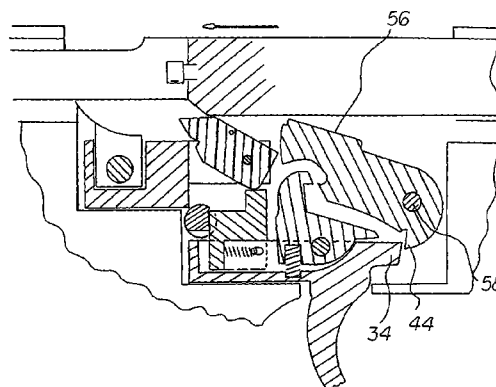
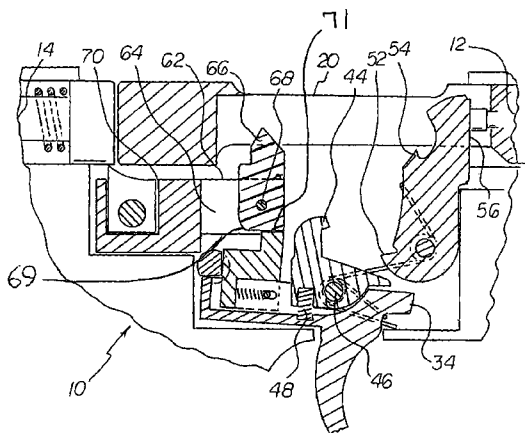
Primary Examiner—Troy Chambers

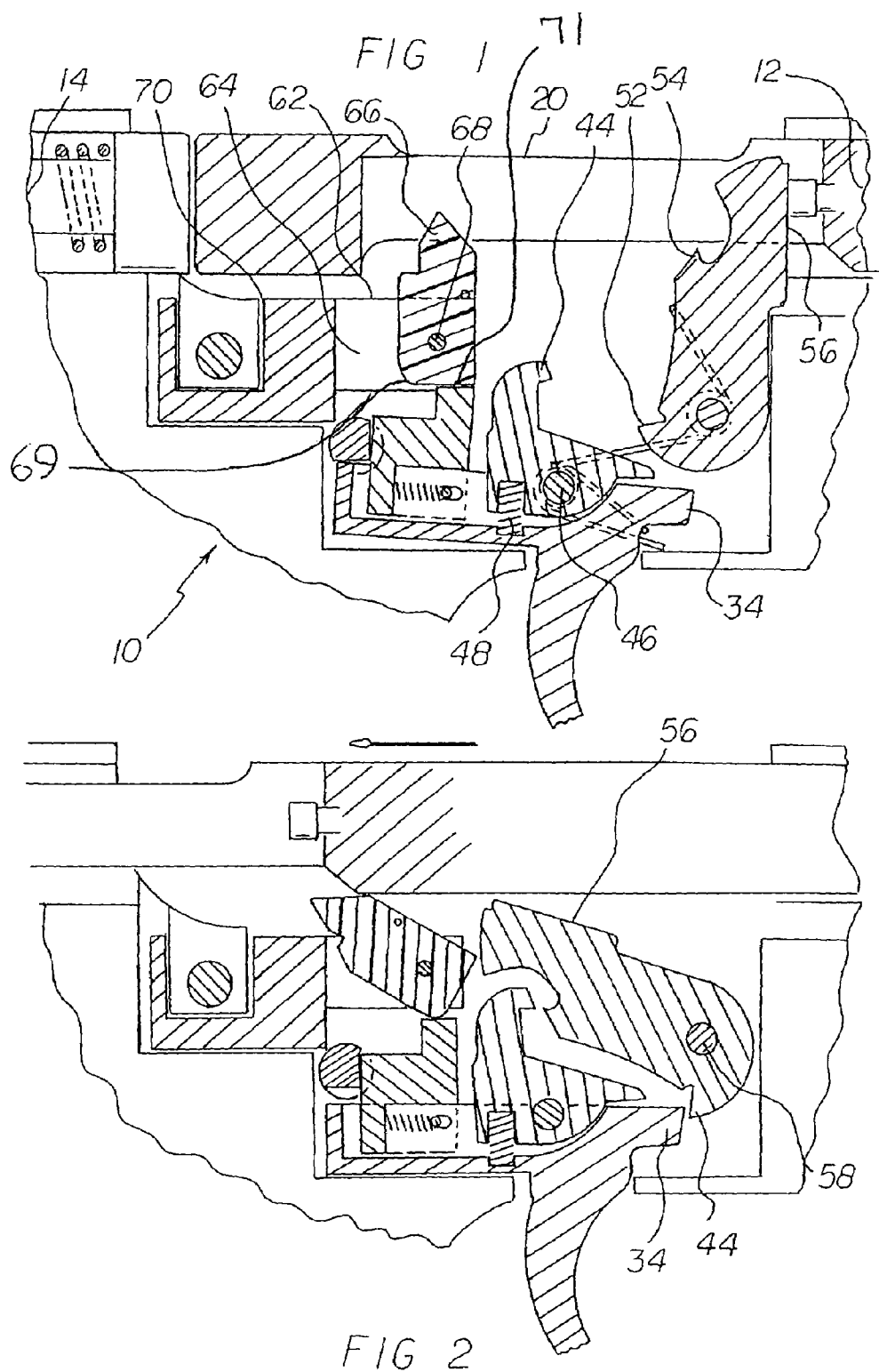
(74) *Attorney, Agent, or Firm*—Edward P Dutkiewicz

(57) **ABSTRACT**

A semi-automatic firearm has forward and rearward ends. A receiver has a safety selector aperture, a barrel, a reciprocating loading mechanism and a magazine. A trigger finger and inner portions. The inner portion has a seat with a groove. A disconnecter has a hammer hook coupled to the trigger. A trigger mounting pin couples the trigger to the firearm. A trigger disconnecter spring couples the trigger and the disconnecter. A hammer having an upper striking portion with a disconnecter hook receptacle. A hammer mounting pin couples the hammer to the firearm. A hammer spring is coupled to the hammer and hammer mounting pin. A cam body subassembly comprises a cam body housing, a cam and a cam mounting pin. The cam body subassembly is coupled to the firearm. A safety selector is coupled to the firearm. A trigger extender is mated with the upward trigger groove.

1 Claim, 5 Drawing Sheets



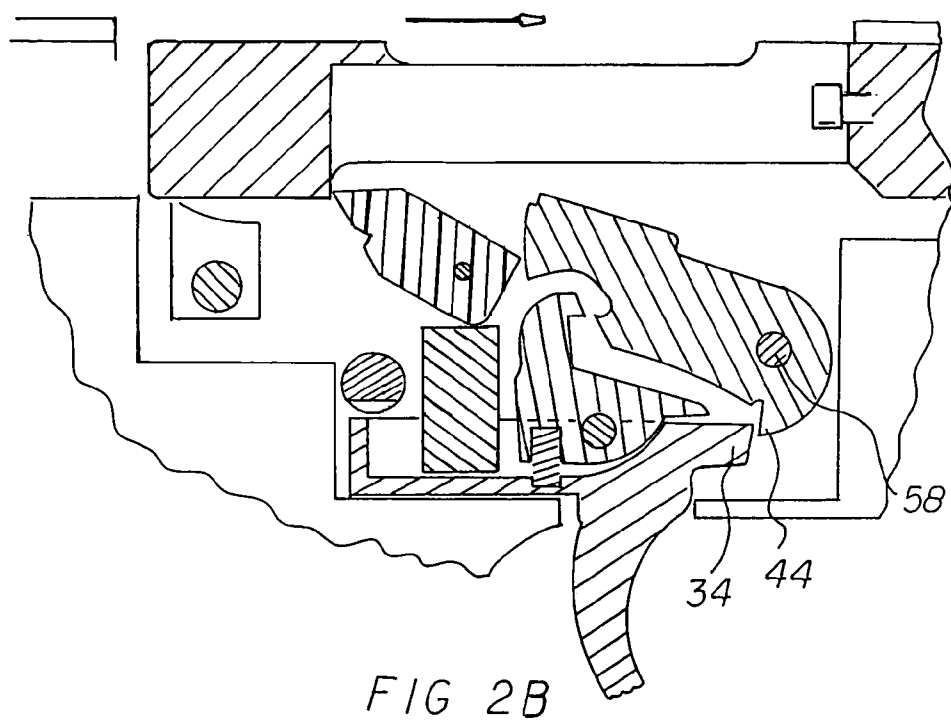
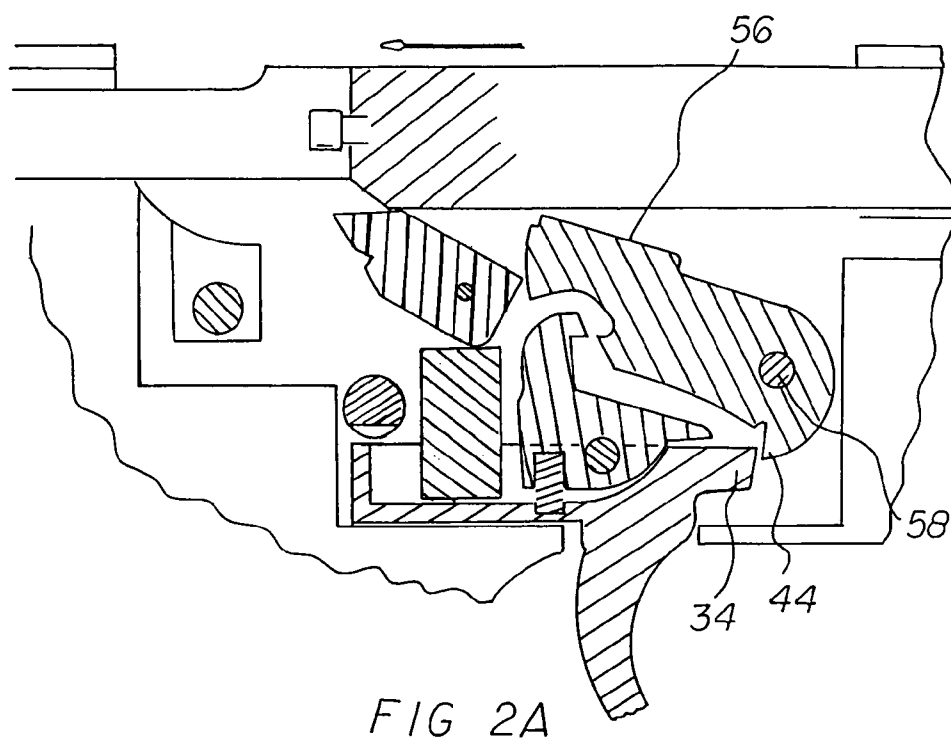


U.S. Patent

Jul. 15, 2008

Sheet 2 of 5

US 7,398,723 B1

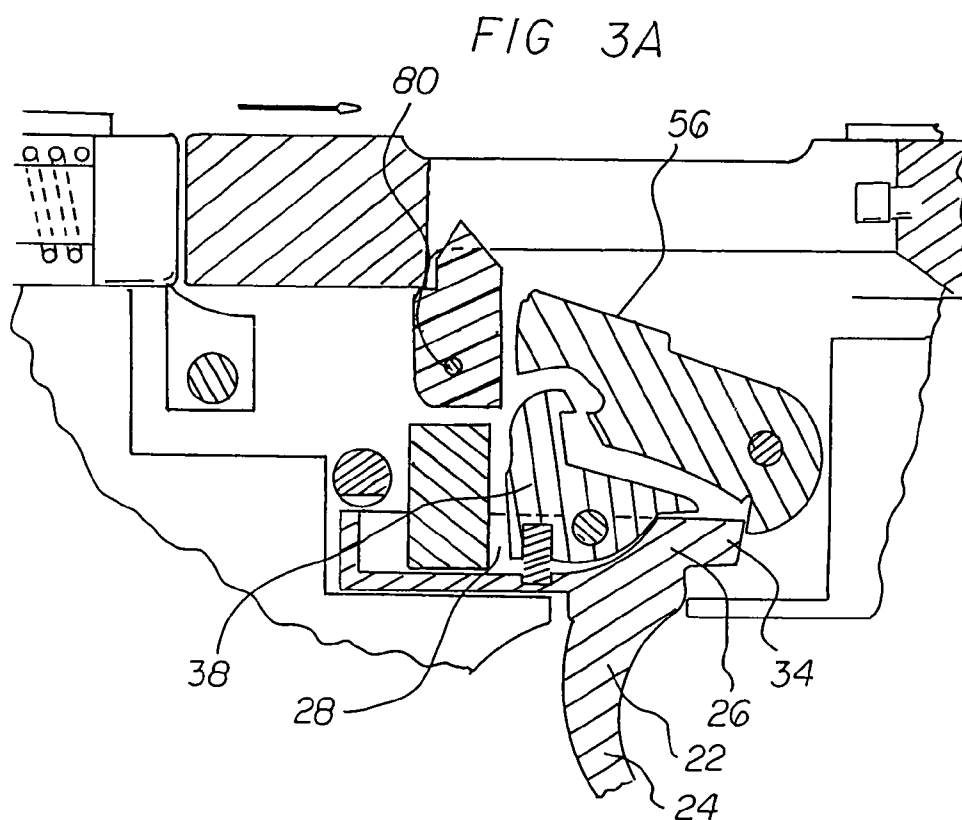
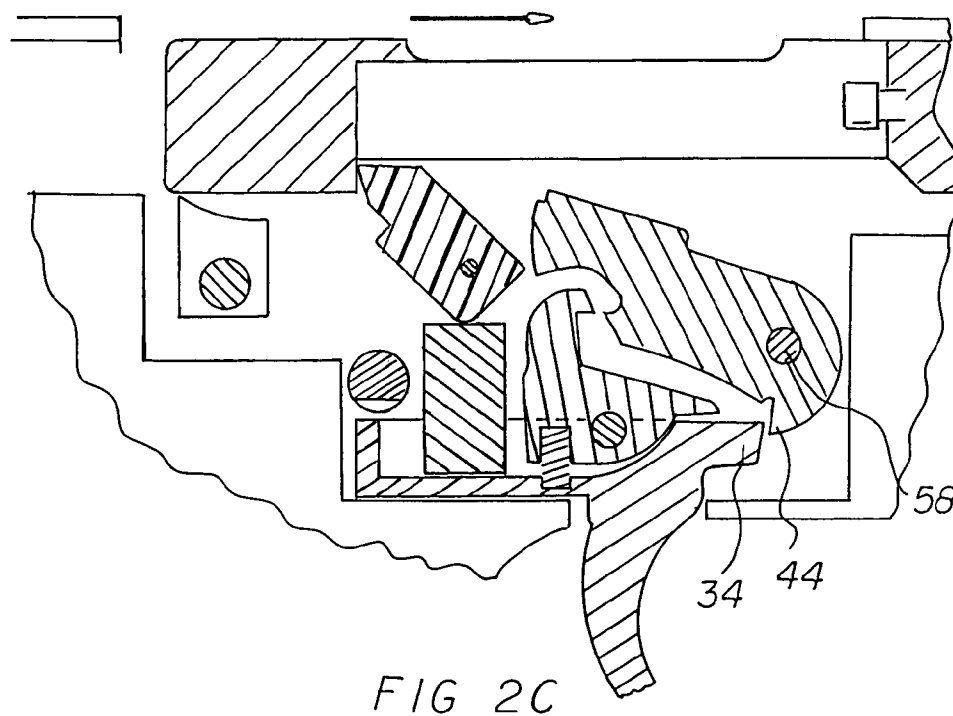


U.S. Patent

Jul. 15, 2008

Sheet 3 of 5

US 7,398,723 B1



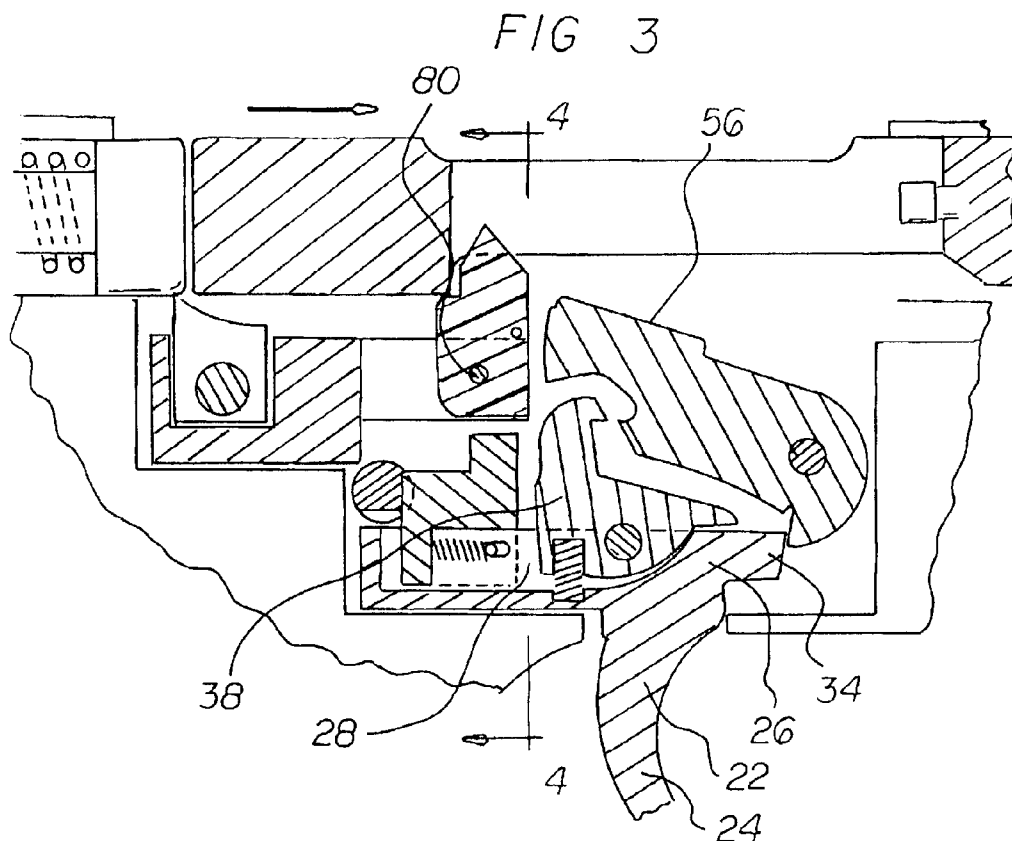
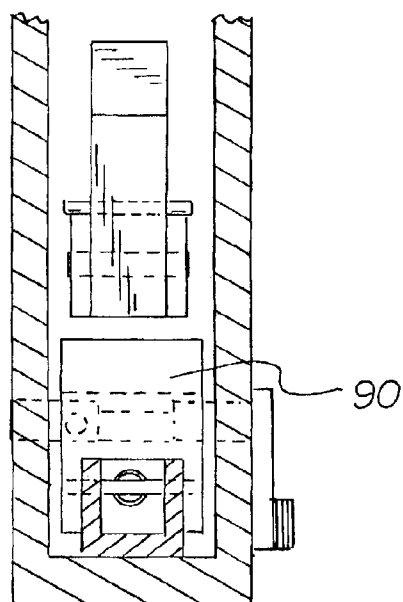


FIG 4



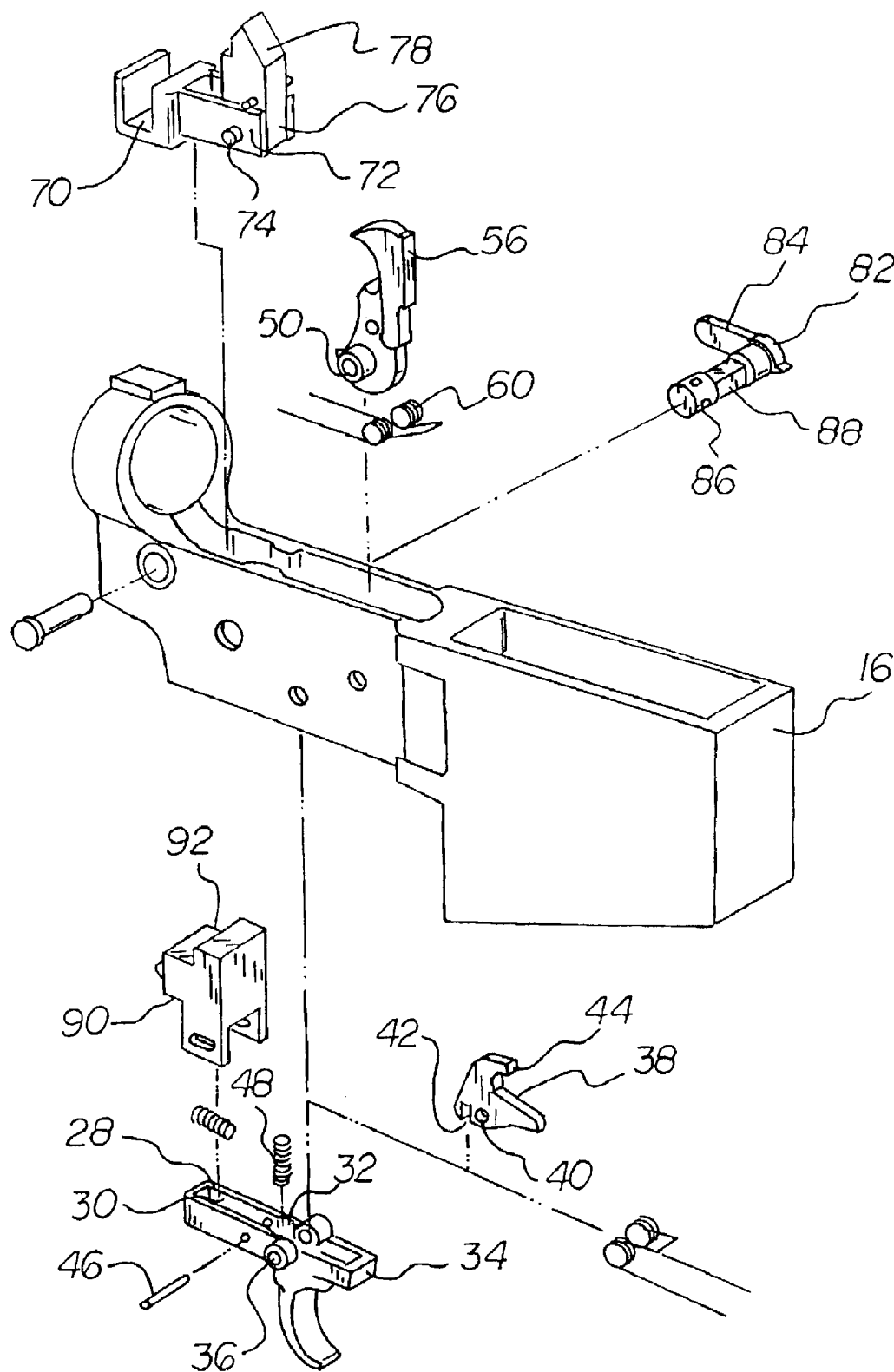


FIG 5

US 7,398,723 B1

1

**TRIGGER FORWARD DISPLACEMENT
SYSTEM AND METHOD****BACKGROUND OF THE INVENTION****1. Field of the Invention**

The present invention relates to a trigger forward displacement system and method and more particularly pertains to increasing the cyclic rate of actuating the trigger and discharging a semi-automatic firearm.

2. Description of the Prior Art

The use of accelerating assemblies for semi-automatic firearms is known in the prior art. More specifically, accelerating assemblies for semi-automatic firearms previously devised and utilized for the purpose of accelerating the cyclic firing rate of semi-automatic firearms are known to consist basically of familiar, expected, and obvious structural configurations, notwithstanding the myriad of designs encompassed by the crowded prior art which has been developed for the fulfillment of countless objectives and requirements.

By way of example, U.S. Pat. No. 6,101,918 issued Aug. 15, 2000 to Akins discloses a method and apparatus for accelerating the cyclic firing rate of a semi-automatic firearm. U.S. Pat. No. 4,023,465 issued May 17, 1977 to Inskip discloses a firearm. U.S. Pat. No. 4,787,288 issued to Miller discloses a rapid fire trigger activator. Lastly, U.S. Pat. No. 4,697,495 issued Oct. 6, 1987 to Beretta discloses a tripping mechanism for the conversion closed-bolt automatic rifles to open-bolt ones.

While these devices fulfill their respective, particular objectives and requirements, the aforementioned patents do not describe a trigger forward displacement system and method that allows increasing the cyclic rate of actuating the trigger and discharging a semi-automatic firearm.

In this respect, the trigger forward displacement system and method according to the present invention substantially departs from the conventional concepts and designs of the prior art, and in doing so provides an apparatus primarily developed for the purpose of increasing the cyclic rate of actuating the trigger and discharging a semi-automatic firearm.

Therefore, it can be appreciated that there exists a continuing need for a new and improved trigger forward displacement system and method which can be used for increasing the cyclic rate of actuating the trigger and discharging a semi-automatic firearm. In this regard, the present invention substantially fulfills this need.

SUMMARY OF THE INVENTION

In view of the disadvantages inherent in the known types of accelerating assemblies for semi-automatic firearms now present in the prior art, the present invention provides an improved trigger forward displacement system and method. As such, the general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new and improved trigger forward displacement system and method which has all the advantages of the prior art and none of the disadvantages.

To attain this, the present invention essentially comprises a semi-automatic firearm. The semi-automatic firearm has a forward end and a rearward end. The semi-automatic firearm is comprised of a receiver. The receiver has a safety selector aperture. The semi-automatic firearm has a barrel and a bolt. The semi-automatic firearm further has a reciprocating loading mechanism and a magazine.

2

A trigger is provided. The trigger is fabricated of rigid material. The trigger has an outer finger portion and an inner portion. The inner portion has a forward end and a rearward end. The finger portion has a generally forwardly displaced and downwardly projecting arcuate configuration. The rearward inner portion has a seat. The seat comprises a generally rectangularly configured rearward portion. The seat has two upwardly projecting side walls and a rear wall. The walls form an upwardly displaced groove. The groove has a first width. The inner portion of the trigger also has upwardly facing spring recesses. The recesses are forward of the groove. The forwardmost end of the inner portion has a beveled sear portion. A mounting pin hole is provided through the inner portion of the trigger. In this manner the trigger is allowed to rotate about the pin hole.

A disconnecter is provided next. The disconnecter is fabricated of rigid material. The disconnecter has a lower attachment portion and an upper portion. A mounting pin hole is provided through the lower attachment portion. The lower attachment portion has a downwardly disposed spring recess. The upper portion has a generally forwardly oriented hooked configuration with a hammer hook.

Provided next is a trigger mounting pin. The trigger mounting pin couples the disconnecter and the trigger to the firearm receiver. In this manner the pivotal motion of the trigger and the disconnecter is allowed about the trigger pin.

A trigger disconnecter spring is provided. The trigger disconnecter spring couples the trigger and the disconnecter. The spring is nested in the trigger spring recess and the disconnecter spring recess and biasing the hammer hook of the disconnecter in a forward position.

Next, a hammer is provided. The hammer has a pair of parallel side walls. A thickness is provided between the side walls. The hammer has a lower attachment portion and an upper striking portion. A hammer mounting pin aperture is provided through the attachment portion from side to side. The lower portion has a trigger sear catch. The trigger sear engages the trigger and the hammer. The upper portion has a rearwardly displaced disconnecter hook receptacle a striking surface. The striking surface is forwardly disposed.

A hammer mounting pin is provided. The hammer mounting pin is sized to couple the hammer and the receiver. In this manner the hammer is allowed to pivot about the hammer mounting pin.

Provided next is a hammer spring. The hammer spring is coupled to the hammer mounting pin. The hammer spring pushes the hammer in a forwardly direction.

Also provided is a cam body subassembly. The cam body subassembly comprises a cam body housing, a cam, and a cam mounting pin. The cam body has a generally rectangular configuration. The cam body has two side surfaces, a rear surface, and a forward surface. The cam body further has a top surface and a bottom surface. The body has a forward portion and a rearward portion. A side to side recess is provided through the rearward portion. In this manner the receiver of the firearm is accommodated. The forward portion has a pair of forwardly projecting cam holders. Through each cam holder is a cam holder pin aperture. The cam has a lower portion. The lower portion has a lower surface. The cam has an upper portion, a front portion, and a rear portion. The lower portion has a generally rectilinear configuration. The upper portion has an upwardly projecting front and rear beveled configuration. In this manner a point is formed. A cam pin aperture is provided in the cam. The cam pin aperture aligns with and mates with the cam holder pin apertures. The cam mounting pin is sized to be received by and mated with the

ATF 0570

US 7,398,723 B1

3

cam holder pin apertures. The cam mounting pin allows the pivotal rotation of the cam about the mounting pin.

Further provided is a safety selector. The safety selector has an outer portion and an inner portion. The outer portion comprises a downwardly displaced lever. The inner portion has a generally solid tubular configuration. The inner portion has a plurality of flat recessed surfaces. The selector is mated with and received by the receiver safety aperture. In this manner the selector is rotatable when in place.

Last provided is a trigger extender. The trigger extender is in a generally rectilinear configuration. The trigger extender has a stepped upper surface and a lower surface. The trigger extender has two parallel side surfaces and parallel front and rear surfaces. The lower surface has a first external side. The first external side has a side to side first width to be received by and mated with the upward trigger groove. The stepped upper surface is flattened and mated with the lower surface of the lower portion of the cam. Mating with the cam is allowed in a rearward position and a disconnected with the cam in the forward position.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject matter of the claims attached.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of descriptions and should not be regarded as limiting.

As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

It is therefore an object of the present invention to provide a new and improved trigger forward displacement system and method which has all of the advantages of the prior art accelerating assemblies for semi-automatic firearms and none of the disadvantages.

It is another object of the present invention to provide a new and improved trigger forward displacement system and method which may be easily and efficiently manufactured and marketed.

It is further an object of the present invention to provide a new and improved trigger forward displacement system and method which is of durable and reliable construction.

An even further object of the present invention is to provide a new and improved trigger forward displacement system and method which is susceptible of a low cost of manufacture with regard to both materials and labor, and which accordingly is then susceptible of low prices of sale to the consuming public, thereby making such trigger forward displacement system and method economically available to the buying public.

Even still another object of the present invention is to provide a trigger forward displacement system and method

4

for increasing the cyclic rate of actuating the trigger and discharging a semi-automatic firearm.

Lastly, it is an object of the present invention to provide a new and improved trigger forward displacement system and method. A semi-automatic firearm has forward and rearward ends. A receiver has a safety selector aperture, a barrel, a reciprocating loading mechanism and a magazine. A trigger having finger and inner portions. The inner portion has a seat with a groove. A disconnector has a hammer hook coupled to the trigger. A trigger mounting pin couples the trigger to the firearm. A trigger disconnector spring couples the trigger and the disconnector. A hammer having an upper striking portion with a disconnector hook receptacle. A hammer mounting pin couples the hammer to the firearm. A hammer spring is coupled to the hammer and hammer mounting pin. A cam body subassembly comprises a cam body housing, a cam and a cam mounting pin. The cam body subassembly is coupled to the firearm. A safety selector is coupled to the firearm. A trigger extender is mated with the upward trigger groove.

These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

FIG. 1 is a cross sectional elevation of the invention depicting the configuration of the firearm mechanism at the time of discharge of the firearm.

FIG. 2 is a cross sectional elevation of the invention depicting the configuration of the firearm mechanism at the time of the firearm bolt engaging the cam and pushing the trigger forward.

FIG. 3 is a cross sectional elevation of the invention depicting the configuration of the firearm at the time the firearm bolt is in a nearly forward, nearly closed position.

FIG. 4 is front sectional elevation of the invention along line 4-4 of FIG. 3.

FIG. 5 is an exploded view of the receiver of a firearm, demonstrating the relationships of the various components of the invention with the receiver.

The same reference numerals refer to the same parts throughout the various Figures.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the drawings, and in particular to FIG. 1 thereof, the preferred embodiment of the new and improved trigger forward displacement system and method embodying the principles and concepts of the present invention and generally designated by the reference numeral 10 will be described.

The present invention, the trigger forward displacement system and method 10 is comprised of a plurality of components. Such components in their broadest context include a semi-automatic firearm, a trigger, a disconnector, a trigger

US 7,398,723 B1

5

mounting pin, a trigger disconnect spring, a hammer, a hammer mounting pin, a hammer spring, a cam body assembly, a safety selector, and a trigger extender. Such components are individually configured and correlated with respect to each other so as to attain the desired objective.

First provided is a semi-automatic firearm. The semi-automatic firearm has a forward end **12** and a rearward end **14**. The semi-automatic firearm is comprised of a receiver **16**. The receiver has a safety selector aperture. The semi-automatic firearm has a barrel and a bolt. The semi-automatic firearm further has a reciprocating loading mechanism **20** and a magazine.

A trigger **22** is provided. The trigger is fabricated of rigid material. The trigger has an outer finger portion **24** and an inner portion **26**. The inner portion has a forward end and a rearward end. The finger portion has a generally forwardly displaced and downwardly projecting arcuate configuration. The rearward inner portion has a seat **28**. The seat comprises a generally rectangularly configured rearward portion. The seat has two upwardly projecting side walls and a rear wall. The walls form an upwardly displaced groove **30**. The groove has a first width. The inner portion of the trigger also has upwardly facing spring recess **32**. The recesses are forward of the groove. The forwardmost end of the inner portion has a beveled sear portion **34**. A mounting pin hole **36** is provided through the inner portion of the trigger. In this manner the trigger is allowed to rotate about the pin hole.

A disconnect **38** is provided next. The disconnect is fabricated of rigid material. The disconnect has a lower attachment portion and an upper portion. A mounting pin hole **40** is provided through the lower attachment portion. The lower attachment portion has a downwardly disposed spring recess **42**. The upper portion has a generally forwardly oriented hooked configuration with a hammer hook **44**.

Provided next is a trigger mounting pin **46**. The trigger mounting pin couples the disconnect and the trigger to the firearm receiver. In this manner the pivotal motion of the trigger and the disconnect is allowed about the trigger pin.

A trigger disconnect spring **48** is provided. The trigger disconnect spring couples the trigger and the disconnect. The spring is nested in the trigger spring recess and the disconnect spring recess and biasing the hammer hook of the disconnect in a forward position.

Next, a hammer is provided. The hammer has a pair of parallel side walls. A thickness is provided between the side walls. The hammer has a lower attachment portion and an upper striking portion. A hammer mounting pin aperture **50** is provided through the attachment portion from side to side. The lower portion has a trigger sear **52** catch. The trigger sear engages the trigger and the hammer. The upper portion has a rearwardly displaced disconnect hook receptacle **54** a striking surface **56**. The striking surface is forwardly disposed.

A hammer mounting pin **58** is provided. The hammer mounting pin is sized to couple the hammer and the receiver. In this manner the hammer is allowed to pivot about the hammer mounting pin.

Provided next is a hammer spring **60**. The hammer spring is coupled to the hammer mounting pin. The hammer spring pushes the hammer in a forwardly direction.

Also provided is a cam body subassembly **62**. The cam body subassembly comprises a cam body housing **64**, a cam **66**, and a cam mounting pin **68**. The cam body has a generally rectangular configuration. The cam body has two side surfaces, a rear surface, and a forward surface. The cam body further has top surface and a bottom surface. The body has a forward portion and a rearward portion. A side to side recess **70** is provided through the rearward portion. In this manner

6

the receiver of the firearm is accommodated. The forward portion has a pair of forwardly projecting cam holders **72**. Through each cam holder is a cam holding pin aperture **74**. The cam has a lower portion **76**. The lower portion has a lower surface. The cam has an upper portion **78**, a front portion, and a rear portion. The lower portion has a generally rectilinear configuration. The upper portion has an upwardly projecting front and rear beveled configuration. In this manner a point is formed. A cam pin aperture **80** is provided in the cam. The cam pin aperture aligns with and mates with the cam holder pin apertures. The cam mounting pin is sized to be received by and mated with the cam holder pin apertures. The cam mounting pin allows the pivotal rotation of the cam about the mounting pin.

Further provided is a safety selector **82**. The safety selector has an outer portion **84** and an inner portion **86**. The outer portion comprises a downwardly displaced lever. The inner portion has a generally solid tubular configuration. The inner portion has a plurality of flat recessed surfaces **88**. The selector is mated with and received by the receiver safety aperture. In this manner the selector is rotatable when in place.

Last provided is a trigger extender **90**. The trigger extender is in a generally rectilinear configuration. The trigger extender has a stepped upper surface **92** and a lower surface. The trigger extender has two parallel side surfaces and parallel front and rear surfaces. The lower surface has a first external side. The first external side has a side to side first width to be received by and mated with the upward trigger groove. The stepped upper surface is flattened and mated with the lower surface of the lower portion of the cam. Mating with the cam is allowed in a rearward position and a disconnected with the cam in the forward position.

The present invention also comprises a method for automatically actively and positively moving a trigger from a rearward firing position into a forward ready position during the loading cycle of a semi-automatic firearm.

The first step of the method is providing a semi-automatic firearm having a forward end and a rearward end comprising a receiver having a safety selector aperture and a barrel and a bolt and a reciprocating loading mechanism and a magazine.

The next step is providing a trigger fabricated of rigid material having an outer finger portion and an inner portion with the inner portion having a forward end and a rearward end, the finger portion having a generally forwardly displaced and downwardly projecting arcuate configuration, with the rearward inner portion having a seat, the seat comprising a generally rectangularly configured rearward portion with two upwardly projecting side walls and a rear wall, the walls forming an upwardly displaced groove having a first width, the inner portion of the trigger also having upwardly facing spring recess forward of the groove, the forwardmost end of the inner portion having a beveled sear portion, with the inner portion of the trigger having a mounting pin hole there through for allowing the trigger to rotate about the pin hole.

The next step is providing a disconnect fabricated of rigid material having a lower attachment portion and an upper portion, the lower attachment portion having a mounting pin hole there through, the lower attachment portion having a downwardly disposed spring recess, with the upper portion having a generally forwardly oriented hooked configuration with a hammer hook.

The next step is providing a trigger mounting pin for coupling the disconnect and the trigger to the firearm receiver to allow the pivotal motion of the trigger and the disconnect about the trigger pin.

The next step is providing a trigger disconnect spring for coupling the trigger and the disconnect, the spring being

US 7,398,723 B1

7

nested in the trigger spring recess and the disconnecter spring recess and biasing the hammer hook of the disconnecter in a forward position.

The next step is providing a hammer having a pair of parallel side walls and a thickness there between, the hammer having a lower attachment portion and an upper striking portion with the attachment portion having a hammer mounting pin aperture there through from side to side, with the lower portion having a trigger sear catch to engage the trigger and the hammer, the upper portion having a rearwardly displaced disconnecter hook receptacle and a forwardly disposed striking surface.

The next step is providing a hammer mounting pin sized to couple the hammer and the receiver to allow the hammer to be pivotable about the hammer mounting pin;

The next is providing a hammer spring coupled to the hammer mounting pin, the hammer spring pushing the hammer in a forwardly direction.

The next step is providing a cam body subassembly comprising a cam body housing and a cam and a cam mounting pin, the cam body having a generally rectangular configuration with two side surfaces and a rear surface and a forward surface and a top surface and a bottom surface, the body having a forward portion and a rearward portion, the rearward portion having a side to side recess there through sized to accommodate the receiver of the firearm, the forward portion having a pair of forwardly projecting cam holders, with each cam holder having a cam holder pin aperture there through, the cam having a lower portion with a lower surface and an upper portion and a front portion and a rear portion, the lower portion having a generally rectilinear configuration and the upper portion having an upwardly projecting front and rear beveled configuration forming a point, the cam having a cam pin aperture there through to align with and mate with the cam holder pin apertures, the cam mounting pin sized to be received by and mated with the cam holder pin apertures, with the cam mounting pin allowing the pivotal rotation of the cam about the mounting pin.

The next step is providing a safety selector having an outer portion and an inner portion, the outer portion comprising a downwardly displaced lever with the inner portion having a generally solid tubular configuration with a plurality of flat recessed surfaces, the selector being mated with and received by the receiver safety aperture allowing the selector to be rotatable when in place.

The penultimate step is providing a trigger extender having a generally rectilinear configuration with an upper surface and a lower surface and two parallel side surfaces and parallel front and rear surfaces with the lower surface having a first external side to side first width to be received by and mated with the upward trigger groove, the upper surface being flattened and mated with the lower surface of the lower portion of the cam.

The final step is automatically actively and positively moving the trigger of a semi-automatic firearm from the rearward fire position to the reset, unpulled and ready to fire position by the reciprocating function of the firearm mechanism, such that, once reset, the operator's finger pressure is prevented from being able to move the trigger in the rearward direction toward the fire position until the firearm reciprocating mechanism has reached an approximately closed, ready to fire position, with such means also preventing the binding or displacement of the reciprocating loading mechanism by a pressure placed on the trigger.

What is claimed as the invention is an accelerating assembly to effectively increase the cyclic rate at which the operator may actuate the trigger and discharge a semi-automatic fire-

8

arm. The firearm is a typical semi-automatic firearm containing a reciprocating member which is used to load a round of live ammunition into the chamber, to position the components of the action to be ready to effect the discharge of the loaded round in response to a pull of the trigger by the operator, and to unload the spent cartridge from the chamber of the firearm after firing. The accelerating mechanism incorporates a plurality of parts designed to allow the reciprocating member of the firearm, said reciprocating member including a bolt, bolt carrier, slide or part of another name depending upon the firearm involved.

On the rearward travel of the reciprocating member the mechanism resets the trigger to the forward, ready-to-fire position. The trigger reset may be against the rearward pressure on the trigger applied by the operator's finger. The trigger is positively held in the forward, ready-to-fire position until such time as the reciprocating member has reversed direction and has reached the nearly-fully-forward position where it is safe to allow discharge of the firearm.

When the nearly-fully-forward, or nearly closed, position is reached, the accelerating mechanism disengages and allows the operator to again pull the trigger rearward. This cycle will be repeated the firearm to be discharged at an accelerated rate. The semi-automatic status of the firearm is retained as the firearm only discharges one round of ammunition for each pull of the trigger.

The present invention relates generally to firearms. Specifically, the present invention relates to methods and structural arrangements by which to accelerate the cyclic firing rate of a semi-automatic firearm. The method utilized by this invention is the resetting of the trigger to the forward ready-to-fire position by use of the reciprocating mechanism of the firearm. The mechanism moves the trigger from the fire, rearward, position into the ready-to-fire, forward, position. The trigger is held in the ready-to-fire position until the firearm has completed the discharge, extraction, reloading sequence. Once the sequence is complete and the bolt is in the nearly-fully-forward, or nearly closed position, and then mechanism disengages the trigger thereby allowing the operator to pull the trigger and repeat the sequence. As the trigger is actively moving forward and rearward for each shot fired, and as the shooter must in fact pull the trigger each time, the semi-automatic status of the firearm is preserved.

Fully automatic firearms, commonly referred to as "machine guns" are designed such that they will continue to fire automatically so long as the trigger of the firearm is held in the rearward position. Legally any firearm that discharges more than one shot by a single function of the trigger is a machine gun. While machine guns are legal for civilian ownership in the United States, further manufacture of machine guns for civilian sale was outlawed in May of 1986 thereby fixing the quantity of machine guns available to the civilian market. Due to this "fixed supply" in the face of increasing demand, machine gun prices have continued to rise over time, currently reaching levels that are out of reach for many consumers. Additionally machine guns are regulated by the National Firearms Act which imposes transfer taxes, registration requirements, and other administrative burdens on owners of machine guns. Given this combination of economics and regulatory requirements, many inventors have devised ways to increase the cyclic rate of a semi-automatic firearm without causing the firearm to become a machine gun by violating the "one round per function of the trigger" rule.

One prior known attempt to enhance the cyclic firing rate of a semi-automatic firearm was commonly known as the "Hell Fire System". The Hell Fire System, or HFS, constitutes a spring biased paddle that engages the rear of the trigger and

continually urges it in a forward direction. To operate the HFS, on balances the firearm by supporting it with one hand grasping the fore-end of the stock and with the hand having the trigger-finger positioned so the trigger finger is within the trigger guard of the firearm but that hand is otherwise not touching the firearm. The hand with the trigger finger is held in a fixed position. The operator then uses the hand that grasps the fore-end of the firearm to pull the firearm away from his body causing the trigger to contact that approximately statically held trigger finger and with continued pulling by the first hand, the trigger finger is made to pull the trigger. When the firearm discharges and recoils, the entire firearm moves rearward which also moves the trigger rearwardly away from the approximately statically held trigger finger. Throughout this sequence the operator is continually pulling the firearm away from him with the hand on the fore-end but his attempt to do so is briefly interrupted by the recoil impulse.

As the recoil impulse subsides the operator's continued pulling will once again move the firearm away from the body causing the trigger to impact the trigger finger and the process repeats. Accuracy and reliability suffered greatly as the firearm could not be shouldered and the technique required practice to develop.

Another known method is the Akins patent (U.S. Pat. No. 6,101,918) referenced by this patent which takes the HFS principle and renders it in a mechanically controlled form that is accurate and reliable. By allowing the entire firearm frame, action and barrel to move within the stock of the firearm, Akins permits the firearm to be shouldered, the trigger finger to be absolutely statically held, and still employ the general HFS principle of allowing the recoil to move the trigger away from the trigger finger. While accurate and reliable, the Akins invention is best suited to firearms in which the receiver of the firearm is coupled to a unitary grip and buttstock so that the shooter's trigger-finger hand can be held stationary relative to the buttstock while the receiver moves within the grip-stock unit.

Many military style arms have a separate pistol grip and buttstock in their military configuration. In order to use the Akins invention these firearms would have to be fitted with a unitary grip-stock combination such as a thumb-hole stock. Therefore, many firearms such as the AR15, L1A1, AK47, etc. would not be able to employ the Akins invention in their original separate-pistol-grip configuration.

Additionally it appears that the Akins invention requires considerable modification to the host firearm in order to permit the receiver to move within the stock and provide a means to urge the receiver forward again after the recoil impulse has subsided.

Lastly, the Inskip patent, (U.S. Pat. No. 4,023,465) also referenced by this patent, appears intended to regulate the rate of fire of a machine gun by allowing the operator to control the rate of fire of the firearm by the pulling pressure on the trigger. The exemplary embodiment of Inskip's invention uses the cycling bolt carrier of an AK47 to move the trigger of the firearm to the forward ready-to-fire position, and then locks the trigger in that position until the bolt carrier returns to battery at which time the trigger is unlocked and the operator again allowed to pull it. According to Inskip's patent disclosure, if the operator pulls the trigger lightly the cycle will be slowed and if the trigger is pulled firmly the cyclic rate will increase. The difference between the present invention and the Inskip invention is that the Inskip mechanism used to allow the bolt carrier to force the trigger forward allows the operator's trigger finger pressure to be transmitted vertically to the bolt carrier during the entire latter portion of the bolt carrier's cycle. Inskip allows the operator's trigger finger

pressure to cam the bolt carrier upward causing friction between the bolt carrier and the adjacent surfaces of the receiver of the firearm. The period when the carrier approaches, then reaches its fully rearward point and reverses directions is a vulnerable point with regard to stoppages as the bolt carrier is in a lower kinetic energy state and more easily halted. Since the transmission of the trigger-finger force persists during this period the resulting friction and displacement is sufficient to cause the bolt carrier to bind and cease travel in some firearms causing a highly undesirable stoppage. The present invention eliminates this problem as follows.

It is, therefore, a primary object of the invention to provide an improved method and apparatus by which the cyclic rate of a semi-automatic firearm can be accelerated by using the reciprocating member of a semi-automatic firearm to reset the trigger to the ready-to-fire position. The mechanism described in this application allows the operator's trigger finger pressure to be overcome during a relatively high energy portion of the reciprocating member's travel. After resetting the trigger, the trigger finger pressure is borne by the accelerating mechanism and is unable to continue to transmit force to the reciprocating member. The trigger is held in the ready-to-fire position until the loading cycle is completed and the gun is safe to fire.

It is another object of the present invention to provide an improved method and apparatus, as above, that will increase the cyclic firing rate without requiring the receiver of the firearm to be modified, however, a version requiring modification of the receiver is also described.

It is another object of the present invention to provide an improved method and apparatus, as above, that will increase the cyclic firing rate without causing the firearm to fall into the legal definition of a machine gun.

After the trigger has been pulled and the hammer has fallen, impacting the firing pin and igniting a round of ammunition, the bolt is driven rearward by the firing action and in so moving will first pivot the hammer to the cocked rearward position whereupon it will engage the disconnecter. As the bolt continues its rearward progress, it will secondly contact the cam pivoting it rearward until such time as the bottom surface of the forward portion of the bolt is allowed to pass over the cam freely. In rotating to the rear (more than 45 degrees) the bottom surface of the cam has pressed downward on the trigger-extension forcing the rear of the trigger down thereby moving forward the surface of the trigger that the operator's finger engages. In resetting the trigger the disconnecter ceases to engage the hammer. The hammer then continues to be held to the rear by the forward engagement surface of the trigger engaging the notch in the sear notch at the bottom of the hammer. The nature of the cam and its action is such that the trigger is held firmly down/forward potentially against the finger pressure of the operator, but the force of the operator's finger is not transmitted to the bolt as an upward displacing force. Such upward displacing force would bind the bolt and abnormally terminate the firing cycle. Ultimately the bolt reaches the mechanical limit of its rearward motion (limited by the buffer spring which is not illustrated) and the bolt begins moving forward by force of said spring. As the bolt nears the end of its forward movement the face of the trailing bottom surface of the bolt (which is lower with regard to the cam than the bottom surface of the forward portion of the bolt) contacts a now vertical surface of the cam rotating the cam forward 8 or more degrees (the impact may rotate the cam further than is mechanically imperative). After the forward rotation of the cam, if finger pressure is applied to the surface of the trigger that is engaged by the operator's finger, the resulting upward force of the trigger-extension against the

US 7,398,723 B1

11

flat surface of the cam currently at an angle to the trigger-extension will force the cam to finish rotating forward to its original position. The applied finger pressure will then be permitted to fully pivot the trigger to the point that it releases the hammer and begin the firing sequence again.

The disclosed invention may also be crafted by eliminating the cam body and instead fashioning the cam and firearm receiver in such a way as to allow the cam to be pinned in place directly to the receiver.

It is intended that the effect of the disclosed invention be able to be optionally selected or deselected by operating the selector-cam and by configuring the trigger extension to be able to move forward and rearward within/upon the rear of the trigger by means of a spring bias that competes with engagement surfaces machined into the selector-cam. Moving the trigger-extension forward or rearward would allow or prevent the cam from contacting the top/bearing surface of the trigger-extension by having the top/bearing surface of the trigger-extension crafted so that it has a lower and higher part, and such that when the lower part is beneath the cam the cam does not make contact with the top/bearing surface of the trigger-extension as the cam moves through its range of motion, thereby allowing or preventing the cam from resetting the trigger.

The invention can be effected without the provision of a selector whereupon the effect of the invention will be continually present unless the apparatus is removed from the firearm.

As to the manner of usage and operation of the present invention, the same should be apparent from the above

12

description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as being new and desired to be protected by Letters Patent of the United States is as follows:

1. A method of accelerating the firing cycle of a semi-automatic firearm comprising the steps of:

depressing a firearm trigger with a finger to discharge the firearm;

activating a reciprocating mechanism within the firearm that causes a cam, in a single rotational motion of the cam, to simultaneously push the trigger forward into a ready to fire position and hold the trigger forward in the ready to fire position until the reciprocating mechanism has reached an approximately closed, ready to fire position.

* * * * *



U.S. Department of Justice

Bureau of Alcohol, Tobacco,
Firearms and Explosives

MAY - 2 2005

903050:RV
3311/2005-372

www.atf.gov



Dear [REDACTED]

This refers to your letter, including illustrations, dated March 21, 2005, to the Firearms Technology Branch (FTB), Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). In your correspondence, you request evaluation of a new firearm trigger design that you are considering for production. Of special importance in this regard is a determination from FTB regarding whether installation of this trigger device in a firearm would result in the manufacture of a machinegun. The diagrams you have included describe the function of a both a generic trigger and your device, which you call an "incremental trigger."

For you information, 26 U.S.C. Section 5845(b), defines "machinegun" as follows:

...any weapon which shoots, is designed to shoot, or can be readily restored to shoot, automatically more than one shot without manual reloading with a single function of the trigger. The term shall also include the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts from which a machinegun can be assembled if such parts are in possession or under control of a person.

Thus, if a firearm continues to fire when you pull the trigger, it would be a "machinegun" as defined. If it is a trigger that causes the firearm to fire in stages, the device may not qualify as a machinegun.

The FTB review of your correspondence found your final paragraph describing the incremental trigger assembly presented in Figure 13 somewhat unclear. You state that Figure 13 "shows the disconnecter moving back up as the bolt moves to the closed position in much the same way as a generic trigger works. The trigger bar also moves up, being released from the trigger stop and a notch engages the sear and the trigger is once again ready to discharge the firearm by pulling the trigger farther backward, or the trigger can be released to totally reset the trigger mechanism allowing it to return to its original position." This description appears to indicate that the firearm would fire in stages and as such would not be a machinegun.

ATF 0576

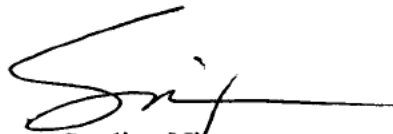
[REDACTED]

Our Branch cannot render a final disposition regarding your trigger device based solely on your written description. Further, we cannot authorize you to make a machinegun. However, you may submit a prototype to FTB for assembly into a firearm and for further evaluation with respect to its classification under Federal statutes.

Please note that if the FTB examination were to determine that the device constitutes a machinegun, it could not be returned.

We trust that the foregoing has been responsive to your inquiry. If you have further questions concerning this matter, please contact us.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'S. Nixon', with a long horizontal stroke extending to the right.

Sterling Nixon
Chief, Firearms Technology Branch

Rick
MAR 25 2005

March 21, 2005

2005-372-RV

Chief, Firearms Technology Branch
Bureau of Alcohol, Tobacco, Firearms and Explosives
Firearms Technology Branch
244 Needy Road
Martinsburg, WV 25401

Dear Sir or Madam:

I am the owner of a small product development company. I am working on the design of a trigger system that would have similar characteristics to trigger attachments available in the market today such as the "Tri Burst Trigger Activator", the "GAT Trigger Activator" and the "BMF Trigger Activator". They all work in a similar manner, mechanically accelerating the rate a trigger is actuated on a semi-automatic firearm. For example, the Tri Burst actuates the trigger three times for one long pull of its trigger lever. All of these trigger attachments require operator motion to operate and discharge each round. They also all attach to the trigger guard of the gun, with their actuation mechanism outside of the trigger guard, creating a hazard, since their triggers can more easily be accidentally actuated, resulting in unintentional discharge of the firearm.

I would like to develop a replacement trigger systems incorporating the above mentioned activator operation features, with a good safety system, contained within the trigger guard of the firearm. I do however want to inquire on the legality of the basic operational parts of such a system prior to any development beyond the basic design concept.

The system I plan to develop is an "incremental trigger system". In this system, the trigger would move a set amount, some increment of the full trigger sweep, and release the sear, discharging the firearm. An additional rearward movement of the trigger, from the first increment to the second would then discharge the firearm again, and so on, until the trigger had been moved maximum range of its motion to the rear. After this, the trigger would need to be released to allow it to reset to discharge the firearm again.

To help explain the incremental in more detail I will first review the parts of a standard semi-automatic trigger system and include sketches to show the parts and their function. The sketches show the basic configuration of each part and how the parts interact. Springs, the safety, and the remainder of the semi-automatic firearm have been left out for clarity.

Figure 1 shows a generic semi-automatic trigger system, that uses a trigger bar and disconnector to control the release of the hammer to discharge the firearm.

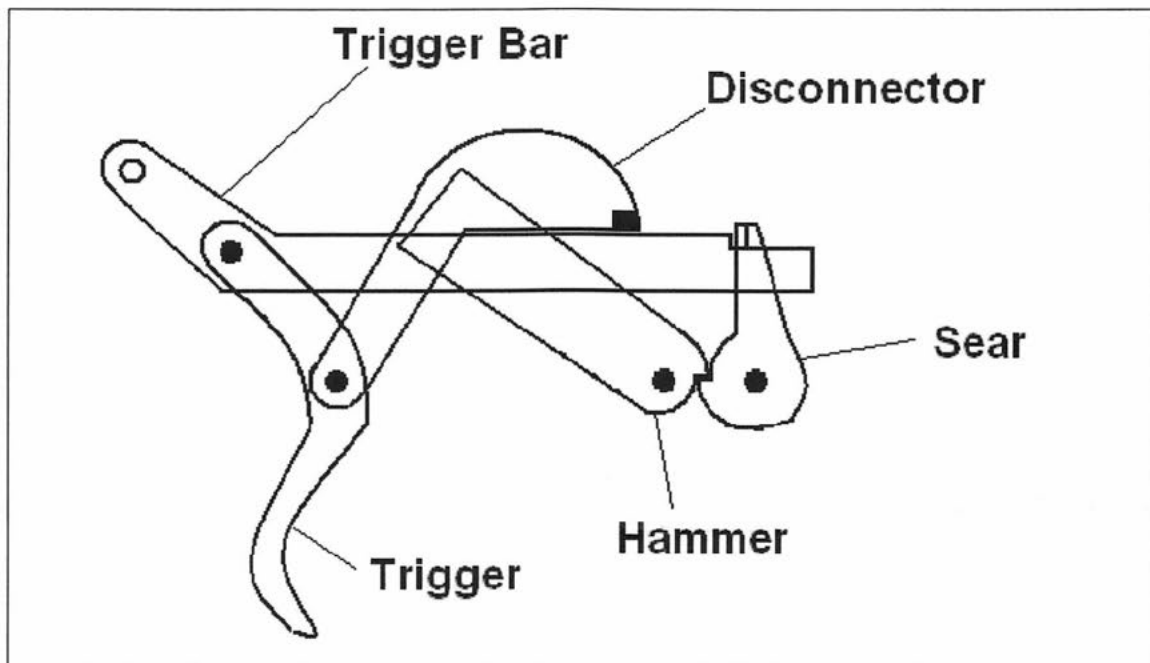


Figure 1 – Generic Semi-Automatic Trigger Assembly

Figure 2 shows the same trigger assembly as the trigger is pulled. The trigger moves back and the trigger bar pushes the sear forward.

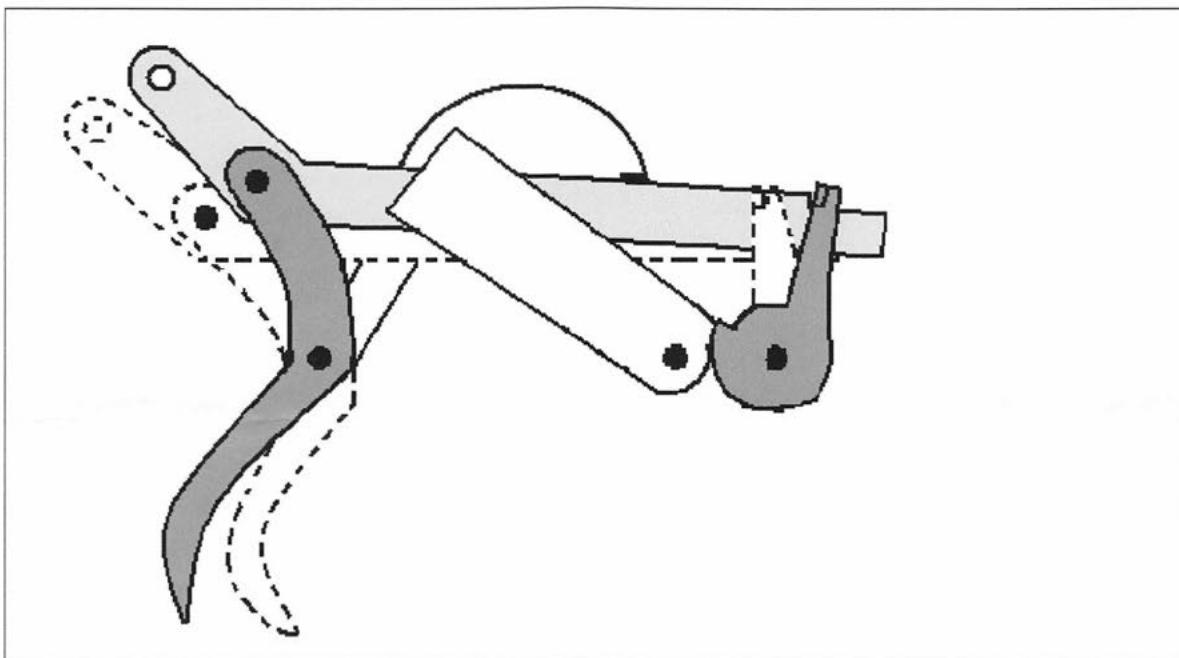


Figure 2 – Generic Semi-Automatic Trigger, Trigger Being Pulled

Figure 3 shows the hammer swing up after the sear has released it to discharge the round in the chamber.

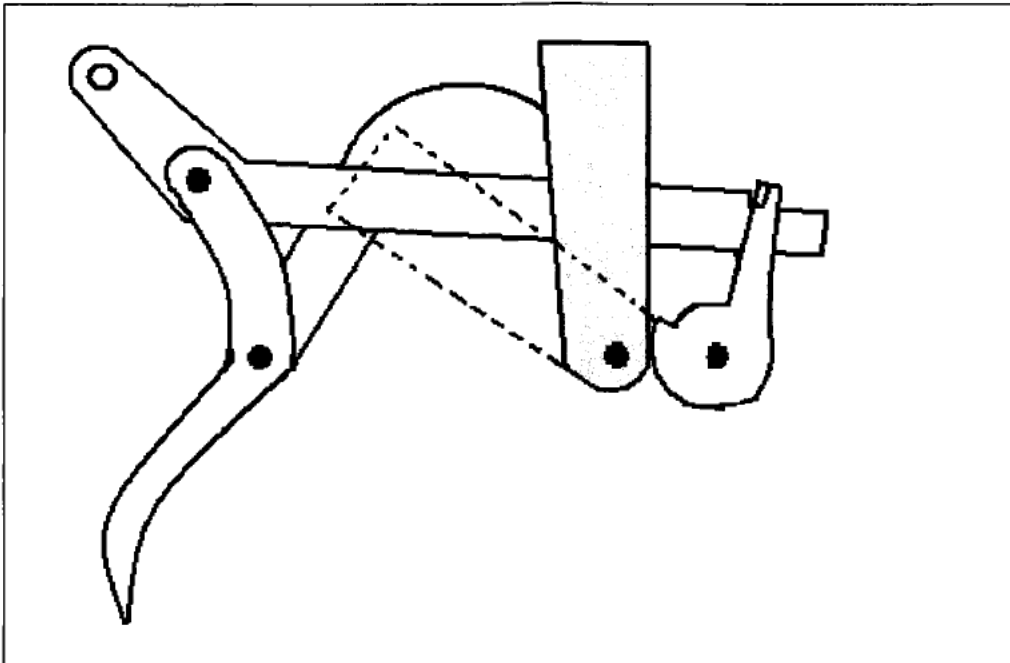


Figure 3 - Generic Semi-Automatic Trigger, Hammer Rotating After Sear Release

Figure 4 shows the hammer being pushed back by the bolt, as the bolt recoils.

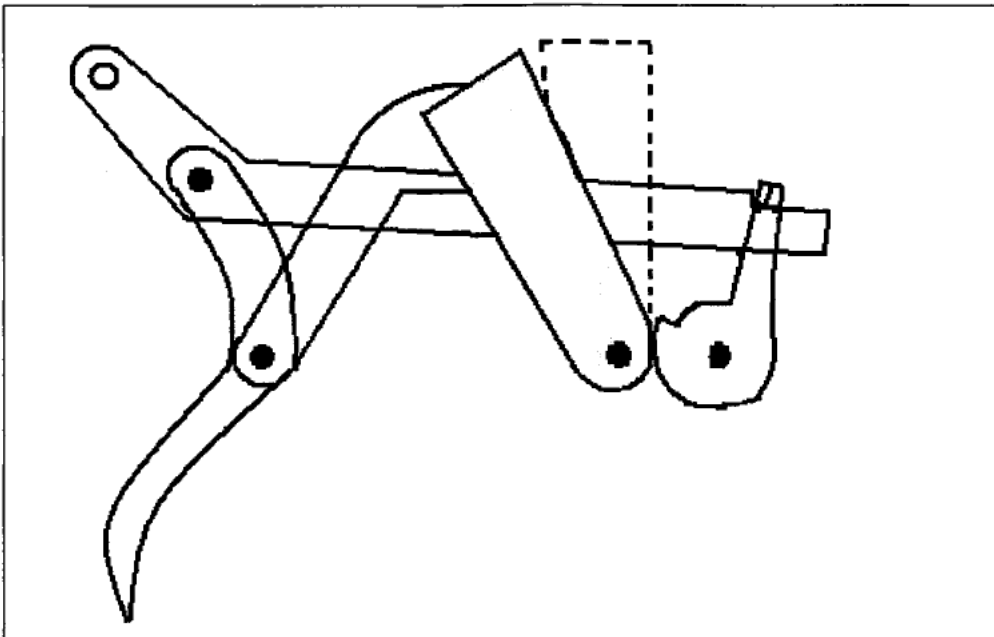


Figure 4 - Generic Semi-Automatic Trigger, Hammer Pushed Back By Bolt

Figure 5 shows the hammer continuing to move back and the disconnector pushing the trigger bar down out of engagement with the sear.